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SOCIAL STRUCTURE AND INNOVATION IN ELEMENTARY SCHOOLS.

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FOCUSING ON THE INTERNAL SOCIAL RELATIONS AMONG MEMBERS OF A SCHOOL STAFF, QUESTIONNAIRE RESPONSES FROM 246 TEACHERS IN 16 ELEMENTARY SCHOOLS WERE ANALYZED IN A COMPARATIVE STUDY TO DETERMINE FACTORS MOST INFLUENTIAL IN INITIATING PRACTICES DESIGNED TO IMPROVE THE CLASSROOM LEARNING CLIMATE. ELEMENTS OF THE SCHOOL SOCIAL SYSTEM REVIEWED WERE THE INDIVIDUAL TEACHER, PEER RELATIONS AMONG TEACHERS, THE PRINCIPAL, AND THE RELATIONS BETWEEN PRINCIPAL AND TEACHERS. FIFTY-SEVEN PERCENT OF THE TEACHERS SAID THEY WERE EMPLOYING INNOVATIVE PRACTICES FOR IMPROVING MENTAL HEALTH OR LEARNING. NINETY-TWO PERCENT REPORTED THEY HAD EMPLOYED OR WERE EMPLOYING AT LEAST ONE OF 12 LISTED INNOVATIONS IN THE CLASSROOM. PEER REPORTS INDICATED AN INNOVATIVE RATE OF 58 PERCENT ACROSS ALL SCHOOLS. VARIABLES WHICH APPEARED TO BE POSITIVELY AND SIGNIFICANTLY CORRELATED WITH EDUCATIONAL INNOVATION IN THE CLASSROOM INCLUDED TEACHER EDUCATIONAL LEVEL, EXPERIENCE, AND FELT AND DESIRED INFLUENCE. WITH RESPECT TO PEER RELATIONS, VARIABLES FOUND SIGNIFICANTLY AND POSITIVELY CORRELATED INCLUDED PERCEPTION OF THE STAFF AS A COHESIVE UNIT AND NOMINATION BY PEERS AS HIGHLY INFLUENTIAL AND ENTHUSIASTIC ABOUT NEW APPROACHES TO TEACHING. DUE TO THE INADEQUACY OF MEASUREMENT CONCEPTS AND OPERATIONS AND THE RELATIVE HOMOGENEITY OF THE SCHOOLS CONCERNED, HYPOTHESES CONCERNING THE ORGANIZATIONAL LEVEL OF ANALYSIS WITH REGARD TO PEER AND PRINCIPAL RELATIONS WERE CONSISTENTLY UNCONFIRMED. THIS MATERIAL WAS SUBMITTED AS A DISSERTATION TO THE UNIVERSITY OF MICHIGAN, 1966, AND IS ALSO AVAILABLE FROM UNIVERSITY MICROFILMS, ANN ARBOR, MICHIGAN 48103, FOR \$3.00 MF, \$6.20 XEROGRAPHY. (JK)

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SOCIAL STRUCTURE AND INNOVATION
IN ELEMENTARY SCHOOLS

by
Mark Arnold Chesler

A dissertation submitted in partial fulfillment
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CHAPTER I

INTRODUCTION TO THE PROBLEM

It is fashionable in these times to be concerned about the character and structure of American education. Those people concerned range from philosophers and social scientists, through professional and lay leaders, to parents and children themselves. The focus of concern may be the nature of the curriculum, the training of teachers, the place of religious and moral ideology in class or the need to better serve minority populations. Other foci of concern may be the institutions performing educational services; their funding operations, the place of lay or professional controls, the role of professional unions and agencies, and the social organization of teaching and learning. As the principal public agent devoted to the task of the socialization of our youth, the American public school system is a critical societal institution. Moreover, it is largely a professional institution, with almost all its personnel carefully trained to influence and manage their roles with a large and varied clientele.

In a society greatly concerned with its own growth and perfection, and with the training of its youth, much attention is naturally focused on the change and improvement of public schools. With so many varied programs and ideas for change, it is well worth the time and energy to stop and ask, "What are the critical variables in such an improvement process?"

When the local school or school system is conceived as a social system, several critical points of inquiry and leverage for change

become prominent. Clearly, one central issue is the relationship between this social institution and other societal institutions. The school system has interchange with other institutions at several key points. First of all it is related to other youth-serving agencies in the local community, as well as to mainstream political, economic and moral systems. Many of these institutions jointly plan how to expend community resources and opportunities. Inasmuch as administrators, teachers and students spend much of their time outside of the school, they represent another opportunity for constant interchange and interaction between the school and the non-school world.

Another major issue is the character of internal relationships within a school or school system. Within a school system the various member schools and their representatives interact with a hierarchy of managers and administrative supervisors. In addition, within each school there are complex organizational and interpersonal relations that must be dealt with effectively. Finally, of course, there are the critical interactional episodes between teachers and students, partners in the teaching-learning process.

One of these broad major issues is explored in this study; the internal social relations among members of a school staff. That this is the only important problem is demonstrably untrue; that this is an important focus for potential scientific and educational development is incontestable. Our focus on these relations may shed light on a number of other issues, all directly relevant to the success of the teaching-learning process. As Charters points out, any inquiry effort must attend to the combined effects of many variables in the educational setting: "The teaching-learning process of the classroom is, in a very real sense, subordinate to the social system of the

school which, in turn, is only one of the components of the institutional structure of education. Forces which affect the school affect the conduct of the teaching-learning process." (1963, p. 716).

If clear scientific findings could provoke a reformation in the relations among these organizational forces, it would greatly facilitate individual change by teachers and principals. Such scientific findings also would add to our growing knowledge of change strategies some reliable notions of the organizational context within which educational change takes place.

This study grows out of our earlier concerns with the nature of teacher-student interactions in the classroom (Schmuck, Chesler and Lippitt, 1966; Fox, Lippitt and Schmuck, 1964; Fox and Lippitt, 1964). In investigating the potential alternatives that teachers could pursue in the classroom we were struck by the relative inflexibility of teachers' classroom behavior. Many teachers suggested that important barriers to their own growth and experimentation existed in their peer and authority relations in the school. Some teachers felt their principals would not support new and varied content or methodology in the classroom. Others felt there was principal support for trying new ideas, but clear collegial norms against experimentation (Chesler, Schmuck and Lippitt, 1963). Change at this level of staff interaction and feelings about interaction may be assumed to have some effect on teachers' professional behavior and their alternatives for classroom management.

There is a history of professional concern about problems of staff relations in public schools. Many schools of education sponsor courses in educational sociology and educational administration, and numerous textbooks have been written about the subject. But the majority of

these sources of expertise are speculative and prescriptive in nature. They tell what to do in much the same way that teachers are told what methods will work in their classrooms. Both often suffer from a lack of attention to the behavioral and scientific principles underlying roles and organizations. The methods of classroom instruction and school administration must begin to meet the empirical tests of social scientific investigation.

A number of insights and findings from behavioral science studies of organizations could well be applied to the educational setting. To a certain extent, of course, schools are not like factories, clubs, armies, gangs, work groups and the like. The lack of clear agreement on the goals of educational systems and the great variation in organizational inputs in the form of learners are markedly divergent from the conditions existing in most formal organizations. Moreover, the school is a professional system. As such, each teacher is an authority in his own classroom; and in many ways his role performance is both invisible and independent of others. In this sense, social integration in educational systems is more often moral or normative than functional. These issues will be discussed in more detail in Chapter II. For the present, however, it is important to note that such differences have long provided educators with an isolation and protection from new knowledge and practice in organizational development and management. Stressing their unique professional training and duties, many educational administrators have denied the relevance of findings from other institutional settings.

This study will attempt to empirically investigate some aspects of the social structure of elementary schools. It will not study all

of the issues potentially at work, but a limited set of important relations. The study is furthermore limited to investigating and reporting characteristics of elementary schools. These schools are likely to be smaller and more homogeneous than junior and senior high schools, and it seems appropriate to begin this inquiry with a simpler analytic target. In those cases where we do discover principles and generalizations that indeed typify, describe, or elucidate relations in these schools, they should point the way for similar studies of a greater variety of educational organizations. That this study is moreover limited to educational organizations does not mean that the relevance of the findings can be so limited. Inasmuch as we will freely draw concepts and variables from a broad range of social scientific studies of organizations, this study may well have considerable relevance to the comparative study of organizations.

The social structure of educational organizations cannot be understood best in the abstract, or with a mere typology of structures. These relations and roles can be best investigated when they are considered in relation to other important aspects of the educational enterprise. In this study we will investigate the relationship between certain structural conditions and one major aspect of the teacher's professional activity, teacher innovation in classroom practice. Most models of bureaucratic and administrative management have wrestled with the effects of bureaucratic forms upon individual flexibility and innovation in role behavior. March and Simon (1958) review, for example, several ways in which demands for standardization of rules and regulations, and supervisory necessities may inhibit individual freedom to operate and innovate. Nowhere, outside perhaps

of scientific organizations, is the problem of individual flexibility and innovation as important as it is in the school situation.

A major aspect of the teaching role is constant flexibility, imagination and change in teaching technique and method. The classroom teacher often has to present new material in new ways to new students. If he didn't vary and constantly improve upon his procedure, he could not adapt effectively to students' changing needs and behaviors in the classroom. This is the essential reason innovation in style and content occurs despite the potential barriers established by peer and authority relations. In addition, numerous demands are placed upon the teacher to accomplish a variety of administrative and time-consuming tasks, as well as for teaching to be standardized and related to tried and tested patterns. As we have changed from one-room schoolhouses to larger community schools, increased organizational demands have been placed upon teachers and principals. Time and energy limitations, administrative duties, and aspects of the peer and authority systems may well inhibit the development of flexible and creative teaching.

When educational innovations have been subjected to scientific scrutiny, the emphasis has been placed most frequently upon the innovation itself, rather than upon the conditions of persons and systems involved in its invention and diffusion. Miles notes this trend in decrying "the popular view that the content or demonstrated efficacy of a particular educational innovation, as such, is the crucial thing in determining whether or not it will be adopted and used effectively." (1965, p. 13). It is not our contention that characteristics of innovations are unimportant; but that organizational features of the school, seldom examined, are also crucial.

One result of the personal and organizational circumstances inhibiting teacher innovation is that someone or some institution begins to fulfill the need for developing innovative classroom practices and communicating them to teachers. Principals seldom have the time or energy to do this, neither do most higher level administrators. It is often left to curriculum specialists or academicians to focus upon new methods and materials, as well as to interest teachers in their use. Scientists and administrators concerned with innovation most often see teachers as the target group to be molded, changed or influenced. Seldom are teachers conceptualized or treated as the source of new ideas and practices in education. In fact, in the forward to Miles' book, Innovation in Education (1964), Foshay describes nine groups of people actively involved in educational innovation. None of these groups is teachers!

This strategy of specialization of innovative effort has many economical features, but it also creates several problems. In the first place, many appropriate new methods are bound to come from those practitioners closest to the classroom, and not those far removed from the scene. Further, teachers may need to feel and demonstrate their own sense of esteem and professional competence, and might do this by rejecting all outside ideas. Finally, recent experience in professional settings suggests that many good ideas may develop from the bottom up, rather than from the top down. Ideas that do start from the bottom--from teachers' experiences--may have a greater chance of being accepted and actually used by teachers in their own and others' classrooms. In addition, other teachers can help refine suggested practices and modify them for use in their own

classrooms. This pattern of innovation and communication flow takes full advantage of creative teachers' professional skill at the same time it helps create a climate for democratic participation in educational improvement. It also places teachers in an active inventive posture, rather than in a passive receptive role. When teachers do not share their professional inventions and reactions with their colleagues, they cannot and do not contribute to each other's growth and competence. The educational enterprise is thereby deprived of a prime source of skill, expertise and quality control.

This, then, is the central problem for this thesis. What conditions encourage meaningful and effective teaching innovations? What is the effect of the organizational context--varying peer patterns and principal-staff relations--in schools? The following chapters will examine each of these issues in greater detail and outline their operationalization in the methodology of the current study.

CHAPTER II

SOCIAL STRUCTURE AND INNOVATION IN SCHOOLS

In this chapter we will explore some of the major theoretical issues and research findings relevant to the problems outlined in Chapter I. The review will highlight some of the variables and relations that will be examined in this study.

The Character of Innovation

What is an innovation? And what is a teaching innovation? An innovation is best described as something new, either in terms of a process for doing something, or as a product which can be used. The scientific study of innovation has flourished most widely in the fields of pharmacy and agriculture. Many studies in these areas are summarized by Rogers (1962) and Katz and his colleagues (Katz, 1961; Menzel and Katz, 1955). In the drug industry studies, the innovation is characteristically a pharmacological discovery or operation. The brunt of the research concentrates not upon the discovery process, but upon the diffusion of the innovation; in other words, on the adoption process. Similarly, the great majority of the studies reported by Rogers are essentially concerned with what happens after a new farming practice is invented--how it is received and initiated, or modified and adopted, or rejected by others. He states, in fact, that "Innovators are the first members of a social system to adopt new ideas" (1965, p. 55). In this study our concern is not with the process of adoption as such. It is with the conditions that surround the process of innovation and the public awareness of its existence.

Studies of innovation in education have not focused, in the way the drug and farm studies have, upon the individual practitioner's behavior. They have been much more concerned with new programs that have been invented or created for system-wide adoption. In those instances where teacher behavior is a concern, teachers are not conceptualized as active agents in a change or utilization process, but as targets of someone's influence attempts (Guba, 1966; Pellegrin, 1966). In such analyses and programs the key personnel are "gate keepers"; superintendents, curriculum coordinators and sometimes principals. This trend in research and thinking is also reflected in Miles' (1964) outstanding compendium of educational innovations and innovation research. The sole article in this volume that does deal with teachers' innovations is by Fox and Lippitt (1964).

In this study we are not concerned with new system-wide programs and policies. Rather we are concerned with the teaching practices the individual teacher reports he uses in his own classroom. The meaning we give to innovation is defined by the teacher's perception, and sometimes that of a colleague, that he is using a technique new for him. It is, of course, possible that what is new to one teacher is not new to another. But if it is new to the inventor it does represent his creative power at work, and is therefore worthy of our attention. It is also possible that a teacher's self-report of practices he uses may not be congruent with his actual behavior. In some cases peer reports call attention to this gap between saying and doing, or at least between doing in private and doing in public. In these instances some of the potential distortions of self-reports can be controlled. We have further limited the meaning of innovation by concentrating upon those practices which are designed to improve the classroom learning

climate, thereby deemphasizing systemic innovations such as new texts, curricula and school-wide tracking, and mere classroom gimmicks such as bulletin boards, new marking procedures, role books or library content.

As we have already suggested, in almost no area of organized human interaction is innovation as important as in the teacher-learner transaction. Its very importance, coupled with the peculiar environmental setting within which it occurs, make the innovative act in education markedly different from the process in agricultural or medical institutions. In both these latter areas of social practice the products--more farm yield, faster healing, higher profits--are visible and often assessable. In education this is seldom the case. As a result of often inadequate goal statements, lack of goal consensus, and infrequent evaluation and assessment, there are few clear ways to know and agree upon what is working well, better or best in education. The goals of education, and especially of elementary education, are seldom precise and seldom agreed upon by any groups of professionals or the lay public. The public educational system deals with such cultural pluralism by accepting the goals and styles of many groups and not promoting controversy or hegemony with unequivocal value commitments. The lack of goal precision and consensus make the systematic evaluation of student growth, and evaluation of the teacher's contribution to this growth, very difficult.

The character of educational innovation is also often different from innovation in technological areas. Given the relevance and plurality of values in the educational setting, a new practice often involves not only new habits of skills on the part of the practitioner, but new attitudes and moral commitments as well. Each classroom

implies certain learning goals, therefore, goal reorientation may be an essential part of educational innovation.

Most teachers are committed to doing a good job in the classroom; many spend extra hours and energy improving their skills and abilities. Since it appears to us that increased professional competence goes hand in hand with a greater personal repertoire of teaching styles, and thereby the willingness to innovate in the classroom, we see innovation as a part of the teacher's professional role. The critical questions for us are: Under what organizational conditions are teachers encouraged to develop and publicize this role? And, how can this role orientation and performance be institutionalized in the school system?

It is also possible to interpret the issues of teaching innovation quite differently. Barakat (1966), in tune with Merton (1957), March and Simon (1958), and others, conceptualizes innovation as a form of the resolution of bureaucratic alienation. Barakat explores those characteristics of the educational bureaucracy that promote teacher alienation and disaffection. Three forms of the resolution of alienation include obedient compliance, retreat or opposition, and rebellion. Affirmative rebellion, or creativity, is seen as the generic category of which innovation is an example. This conceptualization of the nature of innovation, and our own treatment of innovation as part of professional role behavior are not mutually exclusive; in fact, they may be quite complementary.

The Staff Social Structure

The staff of a school represents a social system involved in direct interchange relations with other social systems. It is linked to other elements of the total educational enterprise through students, families,

public educational events, representatives to school boards and public agencies, and the like. It would be an error to think we can safely abstract the school from its environmental cradle. But at the same time, the internal staff relations of a school are critical elements themselves in the educational process. Our focus in this study upon the internal staff relations does in no way mean we are blind to the community forces which shape and condition all the actions, theories and data reported and discussed here.

The various elements of the professional social system of the school that we review in this study are the individual teachers, the peer relations among teachers, the principal, and the relations between the principal and teachers. While characteristics of the teachers and principal may be mainly a function of their personal styles conditioned in part by their training and experience, the relations between and among these elements are strongly imbued with role expectations and traditions. The major part of our concern here is with these relationships and roles.

Since educational research has only minimally focused upon teachers as innovators, there ^{are} ~~is~~ almost no data available to suggest directly relevant hypotheses for testing in this study. However, Rogers reports that innovators in adopting farm practices tended to be younger than later adopters (1965). We may expect that the same would be true of teachers, and that younger teachers would also have less tenure and experience as professionals and as members of a school staff. Of course, personal styles and systemic norms interact to influence role behavior. Where the school norms support innovation we may expect that old timers would be more adjusted to this norm and thus innovative.

When norms discourage innovation, the teachers who are newest to the system are most likely to be more innovative. It is quite possible that differentiated norms exist, some of which encourage innovation among older teachers and discourage it among newcomers.

Inasmuch as innovation is an activity involving some public attention and risk, we may expect that teachers who feel more powerful and secure with their colleagues and the principal are more likely to innovate than others. In general, the notion that peer relations are important influences upon behavior stems from the interactional approaches of Mead, Cooley, and primary group theorists. Close others in many ways help define the situation for the individual. In addition, their reactions help form the individual's own self-perception as professional. In these ways peer attitudes and relations cannot help but affect individual behavior. It may be expected that work in a situation where one is liked and respected by peers and supervisors is thus more satisfying and fulfilling.

Charters points out that "one of the most significant of the teacher's relationships--the informal colleague relationship--has been virtually ignored in educational research" (1963, p. 781). Most of our discussion of these peer factors, then, is drawn from other areas of inquiry, from studies of classrooms and industrial organizations. Lippitt, Polansky, Redl and Rosen (1952), Van Egmond (1960) and Schmuck (1962) have demonstrated ways in which classroom peer relations appear to affect students' feelings about themselves, the risks they will take, their social behavior and even academic performance. Similar expectations can be extrapolated from a number of studies in small group dynamics and industrial settings (Cartwright and Zander, 1960; Katz and Kahn, 1966). A high degree of satisfactory peer

activity seems to be an important principle in effective industrial and governmental organization. Stimulated by small group studies (Schachter, Ellertson, McBride and Gregory, 1951; Leavitt, 1951; Festinger, 1950), several authors report the importance of peer group cohesion, loyalty and open communication channels in improving worker satisfaction and effectiveness (Likert, 1958; Seashore, 1954). When the peer relations in a school encourage open and free conversation and professional discussion involving most of the members of the staff, we should find greater evidence of, and attention to, teacher innovation. Schmuck (1962) has developed a means of scoring and analyzing sociometric nominations in the classroom to characterize the peer sociometric structure as either diffuse or central. When the choices are spread out and include most staff members equally, the structure is said to be diffuse. When there are a few highly chosen staff members and some isolated or rejected ones, this structure is said to be centralist. In a open or diffuse structure, one where there is a good deal of shared communication or influence linkages, we should find teachers in greatest touch with one another and encouraged to discuss their classroom practices.

Homans and others report ways in which informal peer relations may lead to the establishment of firmly held norms about productive output (1958; Coch and French, 1948). It is to be expected that this phenomenon occurs in the current context as well. In schools where public norms support innovative teaching and professional activity, there will be a professional atmosphere that is more conducive to teacher innovation.

In addition to the nature of peer relations, however, we must consider the historical importance of the autonomy and independence

of the teacher as professional. One of the most jealously guarded prerogatives and self-identificatory labels of teachers is their status as professionals. Recently, this symbolism has been challenged by some teachers' unions, which claim it represents a defense against the presumed reality of their low pay, low status, and low power roles. But most teachers are, and want to consider themselves, professionals. Therefore, we would expect that in those situations where a teacher does consider himself free to behave in the classroom as he wishes, he will feel free to try new ideas and practices. Where he feels constrained to behave in a standardized way, when he does not feel he has the power to do as he wishes in his own classroom, this teacher will not operate as a full professional. He will not be as likely to innovate. Pelz' studies demonstrate the importance of freedom and autonomy for scientists (1957); but he also demonstrates that this freedom from peer and authority constraints is not absolute. It is also necessary for the scientist or teacher to be involved in some form of social interaction and to receive some support from peer as well as authority figures. The most effective professional norms, then, would not only provide teachers with the freedom to experiment with new roles and styles, but would support and encourage such activity.

In many ways teachers are not dependent upon each other in their work in the way other bureaucratic role occupants are. They do exist in the same social system and may eat and talk together, but their primary role behavior is only minimally coordinated or integrated with their colleagues. Interaction with students goes on behind closed doors; and in elementary schools students remain with one teacher throughout the entire day. Thus students are not a vehicle for teacher

peer interaction and interdependence in elementary schools as they may be in secondary schools. The great deal of autonomy and privacy makes individual teachers fairly invisible to others in their core professional behaviors. The historical support for this pattern make supervision a very ambiguously received activity; some teachers are glad to be supervised, others resist it as intrusion. These characteristics of the teacher's professional role and status help distinguish the school bureaucracy from other forms of bureaucratic organization. Other distinguishing characteristics include some we have already mentioned; the low degree of standardization of the input variables (students) and low agreement on appropriate output measures. Furthermore, the school's operations and management are often subjected to control and direct influence from community forces. The problem of lay and professional control of this public organization makes the school constantly attentive and often reactive to community pressures and concerns.

Clearly a key role and role occupant in the network of staff social relations in schools is the principal. As with most supervisors he has a variety of alternative role opportunities. He can be mainly concerned with his teachers' goal performance, with their good feelings, or with some combination of these tasks. This traditional dichotomization of leadership roles and functions (Benne and Sheats, 1948) has been investigated in the school setting by several scientists. Halpin (1956) discusses the distinction between task-initiating and personal-consideration roles of the principal, while Getzels and Guba (Getzels and Guba, 1957; Guba and Bidwell, 1957) use the terms nomothetic and idiographic to describe essentially the same functions. Getzels also suggests another style, that of the "transactional" leader, who achieves

a balance between these divergent polarities. The principal who is seen by his staff as being transactionally inclined seems to generate the greatest staff confidence and effectiveness.

But in this professional bureaucracy there are additional dimensions of the supervisor's role that must be considered. The principal can be concerned with his teachers' professional activity and growth or not; and he can be concerned about a tight organizational administration or not. He can choose to meet with parents and community leaders a great deal or not at all; he can choose to be, or try to be, warm and friendly, or cold and impersonal. Finally, he can choose to share decision-making power with his staff or keep it to himself. Tannenbaum (1954) and others (French, Israel and Aas, 1960) report that workers feel more satisfied when they feel that they can have some influence on management officials. Similarly, teachers who feel they participate in policy-making roles, and have a say in what goes on in the school, seem to be more satisfied with their work (Chase, 1952). To the extent that teachers feel involved in important professional decisions, they will be more interested and involved in other professionally relevant activities, such as teaching innovations. However, as Tannenbaum (1954) warns, some individuals will be less satisfied by involvement and participation in decision making. We may expect that the general rule of involvement leading to greater satisfaction will hold in most cases, with the reverse being true for teachers with certain personality characteristics and schools with certain principals and certain normative themes. In the same context, Likert's review (1961) can be extrapolated to suggest that teachers will also be more involved when they perceive that their principal has influence

with other principals and with the superintendent's decision-making activities. We would expect teachers to feel effective in influencing their supervisor when they perceive their supervisor, too, as being influential.

The Gross and Herriot (1965) studies suggest that an effective principal is committed to the professional growth and development ^{of} ~~and~~ his staff. This private orientation is only one factor, however, and it must be coupled with public postures validating these concerns to influence teachers to more complete professional considerations. Extrapolations from industrial management studies also suggest that the principal may operate as a role model for his teachers (Kahn, 1956). If the principal demonstrates an interest in professional growth and innovative teaching, his enthusiasm could well contagion to his staff. The perception of principal interest and potential support helps establish firm and visible organizational norms for teachers to follow (Becker, 1953).

We have already suggested that the principal's style of supervision cannot be effective if it is felt to encroach on the professional autonomy and freedom of his teachers (Becker, 1953; Gouldner, 1954; Kahn and Katz, 1960; and Pelz, 1957). Gross and Herriot (1965) highlight this issue as they point out that some administrator efforts to help teachers "might be construed as betraying a lack of confidence in them and as out of bounds. Or, if administrators urge their subordinates to try a new practice, it may be viewed as an encroachment on their rights as professionals" (p. 99). In over 55% of the schools Gross and Herriot studied, the teachers wanted the principals to exert less control over their professional activities; in the remaining 45% the teachers wanted more exercise of principal controls. So an effective

role vis-a-vis professional subordinates must combine the exercise of control with the provision of autonomy. At the same time, the principal can also perform to guarantee his staff's autonomy by mediating external parental and community pressures (Becker, 1953). He can best do this, of course, when he actually does have upwards influence (Likert, 1961).

It is also apparent that an effective educational manager must be in touch with the standards and relationships of his staff members. One important index of this aspect of the principal role is his knowledge about what's going on in his staff. To the extent the principal is accurate about the character and organization of peer relations, we can expect he would know what to do if he wanted to exert influence (Chesler, Schmuck and Lippitt, 1963; Chowdhry and Newcomb, 1952).

In all of these respects it is not enough to know what the principal reports about himself. It is perhaps even more critical to know how the teachers perceive and interpret his behavior. For here, as elsewhere, teachers' phenomenological views of the social system are the most important determinants of behavior. Some authors utilize staff perceptions as a check on the manager's statement of his own behavior; other authors utilize this variance as an important variable itself. It is quite possible, of course, that various informants might not agree on the behaviors of an official (Charters, 1963). Since we are to deal in part with teacher phenomenology, we must recognize that it is not the sole determinant of behavior by any means. A teacher who is an isolate in the sociometric structure will not be able to publicize an innovation no matter how competent

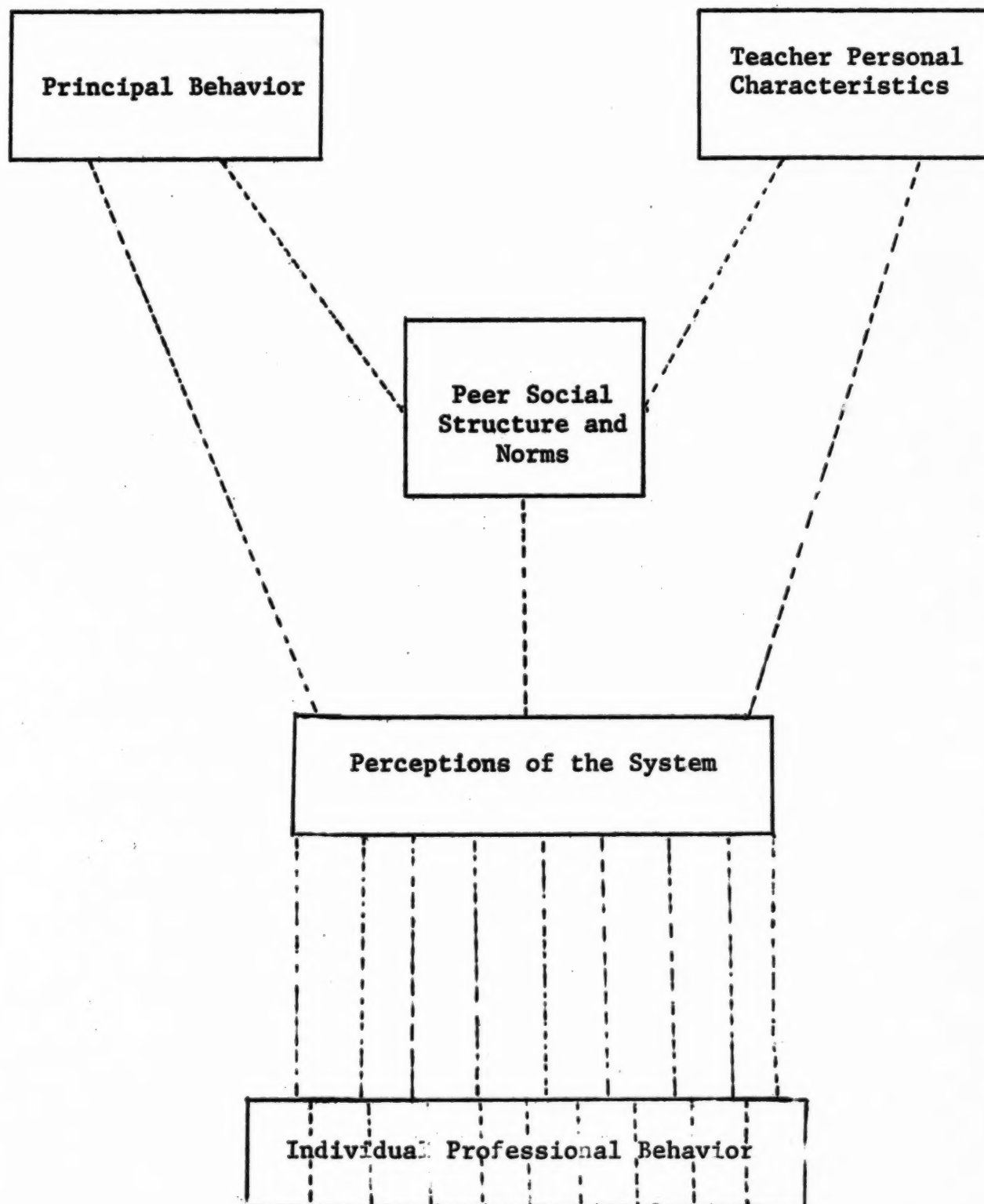
and respected he feels. Our work will permit some comparison between some more objective and other more phenomenological views of the reality of relationships in the school system.

The conflux of these forces in the internal social structure of the staff may be diagrammatically as represented in Figure 1. For instance, the diagram suggests that individual professional behavior, whether innovative or not, is mediated by the teacher's perceptions of the staff social system. These perceptions are a function of the peer social structure and norms, teacher personal characteristics and principal behavior. In turn, the peer social structure is affected both by individual teacher characteristics and principal behavior. From the principal's point of view, he may affect teachers' perceptions and thus behaviors in two ways: (1) directly, through conversation and interaction with teachers or, (2) indirectly, through his influence upon the establishment of certain staff norms and structures. Individual teacher characteristics, too, may be directly related to individual perceptions and role behaviors. On the other hand, they may be mediated by the standards and structures of the peer social system.

This study has several schools as its sample. It will not, therefore, be a case study but a comparative study. Our intention, however, is not to conclude with one phenotypic model for staff realtions and their effects. Some variables will work one way in one system and another way in another system; such is the nature of the equifinality of means-ends relations in social systems. But it is our objective to discover some genotypic outlines which will suggest broad determinants of teachers' professional behavior.

FIGURE 1

REPRESENTATION OF INTERNAL SOCIAL STRUCTURE AND ROLE BEHAVIOR



Some specific hypotheses to this effect, and the description of the sample and instruments utilized to obtain and test these hypotheses, follow in Chapter III.

CHAPTER III

METHODS AND HYPOTHESES

The data to be reported in this study were collected by means of a self-report questionnaire administered to the entire professional staffs of sixteen elementary schools. These sixteen schools are all located in four school systems in Southeastern Michigan. Five of the schools are from two small semi-rural systems, and the remaining eleven schools are from two larger semi-industrial systems. There are a total of two hundred and forty-six teachers in these schools, and the number in each school ranges from six to twenty-eight.

In the preceding chapters the major problems and concerns of this study were outlined. In this chapter more specific and operational definitions of each variable will be presented, along with their particular instrumentation. As each variable is thus defined, hypotheses will be offered to suggest relationships expected on the basis of the research and theory already discussed.

The Dependent Variable

We have attempted to measure personal and organizational innovation in several different ways. Innovation was first assessed by teacher self-report, in answer to the question:

"Are you trying any new, unusual or especially interesting practices for improving pupil mental health or learning?"

Yes _____

No _____

TABLE 1
TEACHERS AND SCHOOLS IN THE SAMPLE

Number of Teachers In a School	Number of Schools
6	1
10	1
11	2
12	1
13	1
14	2
15	3
17	1
19	1
22	1
24	1
28	1
246	16

A second self-report question was utilized to provide a more concrete focus for teachers. In this question we provided teachers with a list of twelve new or unusual practices, including room for additions, and asked them to check ones they were using or had used. Some illustrative stems of this question follow:

1. Here is a list of some new or unusual teaching practices. (1) In the column marked SELF, place a check after those classroom practices that you have tried or are trying now.

	<u>SELF</u>
1. Pupil participation in curriculum planning	
2. Pupil participation in classroom teaching	
3. Unusual grouping techniques	
a. Please specify _____	
4. Role playing	
a. Other dramatic techniques-- specify _____	
5. Group discussion of problem behavior	

Finally, each teacher was asked to nominate his peers if he knew they were trying any such practices. For purposes of peer nominations, each teacher was provided with this list of twelve practices, including room for others, and asked to nominate peers if they knew that they were using or had used any of them. The format of this question was the same as the one above, with additional instructions as follows:

2. In the column marked OTHER TEACHERS, list any teachers you know that are using these practices or other ones that would be helpful to know about.

NUMBER
OR NAME
OF OTHER
TEACHERS

1. Pupil participation in curriculum planning
2. Pupil participation in classroom teaching
3. Unusual grouping techniques
 - a. Please specify _____

Additional indices for the identification and assessment of the dependent variable attempt to view the school itself as the unit of analysis. The school index is constructed by computing the percentage of teachers in each school who are so nominated or who nominate themselves.

Independent and Intervening Variables

Fairly limited data were collected regarding the personal and demographic characteristics of teachers. However, some background characteristics such as sex, age, and length of teaching experience can be cited as relevant. In elementary schools it is common for most teachers to be women. Male teachers are often more occupationally mobile, and tend to teach in junior or senior high schools. Based upon these role expectations, it is probably easier for a female than a male to feel professionally respected and fulfilled at the elementary level of instruction. Therefore, we may hypothesize that:

Hypothesis 1: Female teachers will innovate more than male teachers.

Other aspects of professional role development are most likely to be fulfilled and desired by teachers who are older, have more advanced training, and have greater experience in the profession. We expect that such experiences will more fully socialize teachers into a professional role encouraging innovation. Therefore, we may also suggest that:

Hypothesis 2: Teachers who are older will innovate more than younger teachers.

Hypothesis 3: Teachers with more professional training credits beyond the bachelors degree will innovate more than teachers with less educational training.

Hypothesis 4: Teachers with greater experience teaching will innovate more than teachers with less experience.

We have already suggested the importance of factors such as autonomy and self-direction in the effective development and realization of professional role behavior. Instruments were devised to see how much independent influence or autonomy each teacher felt he had in the determination of his own classroom teaching style.

"In general, how much influence do you think the following groups or persons have in determining the personal teaching styles and techniques you use in your classroom. Place a check in the box that best describes the influence ability of each of a - f."

a a very
great great
a deal deal
no little some of of
infl. infl. infl. infl. infl.

f. You, personally.

--	--	--	--	--

Relevant to this questions is the hypothesis that:

Hypothesis 5: Teachers who feel they have a greater amount of autonomy in determining their classroom style will be more likely to innovate than those who feel they have less self-determination.

The same form of question was utilized to ask each teacher how much influence he felt he had in "determining the curriculum of this school building." It may be expected on the basis of research reported in Chapter II that:

Hypothesis 6: Teachers who feel they have a greater amount of influence in determining the curriculum will be more likely to innovate than those who feel they have less influence.

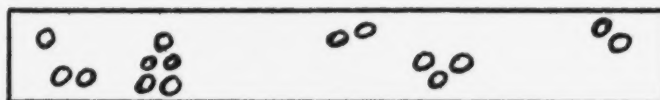
In addition, each teacher was asked how much influence he felt he should have in determining the curriculum. The difference between how much influence a teacher feels he has and ought to have is an indicant of the amount of power that that teacher feels is legitimate and acceptable for him. When the "felt" and "ought" amounts of influence are equivalent, we may expect that the teacher feels satisfied with his involvement and power in professional decision making in that school. Therefore, we may hypothesize that:

Hypothesis 7: The smaller the discrepancy between "felt" power and "ought" power the more a teacher will be likely to innovate.

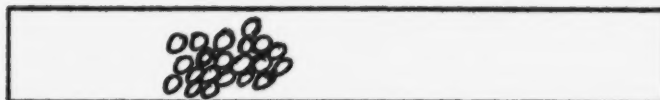
All teachers were asked to describe their social situation in terms of a series of maps of the social relations in the building. The maps provided were as follows:

If you were to look at this staff of teachers as a group, which one of these drawings would most nearly look like this staff?

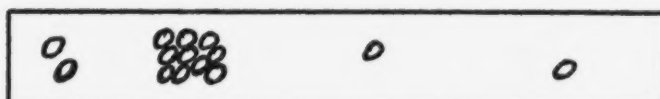
a. -----



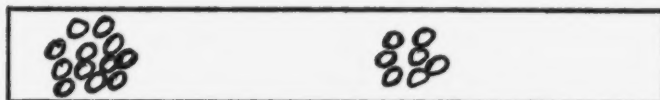
b. -----



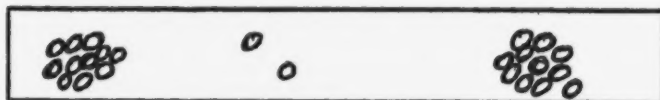
c. -----



d. -----

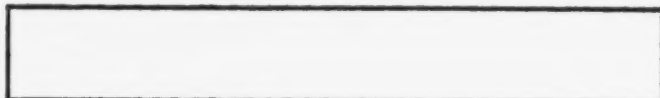


e. -----



Other--please draw

f. -----



It is our expectation that different teachers will find different staff and organizational situations most fruitful and satisfying for themselves. Some teachers will innovate in a cohesive staff; others will find such a situation stultifying. Some teachers will innovate when there is little integration on a staff; others will find such freedom constraining. Therefore, we do not expect that the particular map chosen by any teacher should have any relationship to his innovation.

Hypothesis 8: The map chosen by each teacher will have no relation to his teaching innovativeness.

Teachers also were asked to indicate on this social map their position with regard to these interpersonal groupings of staff

members in the school. Teachers could indicate they were in the middle of staff clusters, on the edge of clusters, involved in triads, in dyads, or isolated. Membership in small face-to-face groups most nearly fulfills our earlier discussion of the teachers' needs for both autonomy and integration. Therefore, we can hypothesize that:

Hypothesis 9: Teachers who place themselves in dyads or triads are more likely to innovate than teachers who are self-placed as isolated or as being in large clusters of their colleagues.

Finally, we may consider that an important aspect of a developed professional role is the ability to seek out relevant sources of assistance and support. Each teacher was asked:

"If you had a problem in running your classroom effectively, who would you go to for help?
(Be specific)"

Those teachers who identified a multitudinous series of resources available to them can be seen as more likely to utilize professional help in improvement in their teaching performance. They can get help if they want it. Therefore:

Hypothesis 10: Teachers who can identify a greater number of potential helpers, are more likely to innovate than those who identify less helpers.

Teachers in all schools were asked to identify those of their peers with whom they communicated the most, those who had the greatest influence in developing staff opinion about teaching, and those who were most enthusiastic about innovative teaching. These sociometric stems were as follows:

Please list numbers of three people in this school you communicate with the most about your activities teaching pupils.

Please list numbers of the three people in this school who you feel are most influential in developing staff opinion about what is "good" and "poor" teaching.

Please list numbers of three people in this school who you feel demonstrate most enthusiasm about new approaches to teaching.

On the basis of these questions, and earlier suggested findings about the role of successful peer relations in professional growth and productivity, it may be expected that:

Hypothesis 11: Those teachers most highly nominated by their peers as being most communicated with, will be most likely to innovate.

Hypothesis 12: Those teachers who are seen by their peers as having the greatest influence upon teaching styles will be most likely to innovate.

Hypothesis 13: Those teachers who are seen by their peers as most enthusiastic about new teaching approaches are most likely to innovate.

The results of these three sociometric nominations can be correlated for the entire staff to provide a picture of the ways in which the "communication," "influence" and "enthusiasm" patterns in a school overlap with one another. Where the "communication" and "influence" sociometrics both correlate highly with the

"enthusiasm" sociometric we have a different peer situation than when these patterns are quite different. Where all three are positively related, i.e., where high "enthusiazers" are also high "communicators" and high "influencers," we may expect that norms about using new approaches are accepted and encouraged by influential peers. Where they do not, where the teachers who are central to the communication or influence structures are not enthusiastic about new approaches, the teachers seen as using new approaches are in doing so deviating from the patterns of influence in the peer social system. Proposed examinations of the sociometric patterns suggest the following hypotheses:

Hypothesis 14: In those schools where the communication and influence sociometrics are both closely related to the enthusiasm sociometric, there will be greater teacher innovation than in those schools where the sociometric structures are unrelated.

When school norms in the person of influential teachers are not seen as supportive of new approaches, certain other elements of professional activity are also affected. In such anti-innovative circumstances, teachers who are likely to be most in tune with local professional norms should behave in a non-innovative way, thus:

Hypothesis 15: In those schools where the influence and communication sociometrics are not highly related to the enthusiasm sociometric, hypotheses 4, 5, and 6 will be reversed.

We have referred, in hypotheses 5, 6, and 7, to the effect of teachers' felt autonomy, felt influence and desired influence upon their prospective innovativeness. Now we can consider these variables at the organizational level of analysis in suggesting that:

Hypothesis 16: In those schools where the teaching staff feels more autonomous, there will be greater innovation than in those schools where the staff feels less autonomous.

Hypothesis 17: In those schools where the teaching staff feels they have more influence on the curriculum, there will be greater innovation than in those schools where the staff feels they have less influence.

Hypothesis 18: In those schools where there is the least total staff discrepancy between teachers' actual and desired influence on curriculum, there will be the greatest innovation.

We have also alluded to Schmuck's (1962) manipulation of classroom sociometric measures to provide an index of the diffuseness or centrality of group structure. In adapting this procedure to our study, each teacher was awarded one "choice" when nominated by a peer as high in a given area of activity or performance. Since each teacher chooses three peers in a given area, the mean "choice" score for the staff is theoretically equal to three. The centrality or diffuseness of a structure is determined by the computation of the staff variance in "choices" received. The centrality of a structure increases as the variability or variance of sociometric choices received increases. A low variability or variance of this distribution characterizes a peer sociometric structure approaching diffuseness. These operations provide the following hypotheses:

Hypothesis 19: In those schools with a more diffuse communication structure there will be more teacher innovation than in those schools with a more central communication structure.

Hypothesis 20: In those schools with a more diffuse influence structure there will be more teacher innovation than in those schools with a more central structure.

Hypothesis 21: In those schools with a more diffuse enthusiasm structure there will be more teacher innovation than in those schools with a more central enthusiasm structure.

In hypothesis 8 we examined the relation between each teacher's perception of the social map of his school and his own innovativeness. While we did not expect that the choice of map would make any difference for a teacher's innovativeness, we do anticipate that the degree of staff agreement or non-agreement on the map chosen would be related to their communal ability to see and feel that they are in the same social setting. When teachers share common perceptions about the social system in which they operate such a situation should be more conducive to professional risk taking and the support of the use of new approaches. Therefore:

Hypothesis 22: Schools where there is a higher degree of staff agreement on a social map will have more innovation than schools with a lower degree of agreement.

We suggested, in Chapter II, that the character of teacher-principal relationships in a school is a critical issue in the creation of an environment that encourages or discourages professional improvement and innovative teaching. A seven item scale was constructed to assess the degree to which teachers felt that their principal did or did not take an active behavioral stance in encouraging and developing innovative teaching.

To what extent does your principal engage in the following kinds of activity?

- a. Has constructive suggestions to offer teachers in dealing with their problems.
- b. Brings to the attention of teachers educational literature, conferences, etc., that is of value to them in their jobs.
- c. Maximizes the different skills found in his faculty in order to have teacher share resources.
- d. Talks to teachers about their personal and professional teaching activities and growth.
- e. Shows he knows what's going on in classrooms in the school.
- f. Demonstrates a warm personal interest in his staff members.
- g. Openly supports creative teaching efforts.

We may expect from this scale that:

Hypothesis 23: Teachers who more often perceive their principal as performing supportive or encouraging acts regarding professional activity, will be more likely to innovate than those perceiving less principal support.

In addition to staff perceptions of principal behavior, another important variable discussed earlier is the degree to which staff members see their principal as having influence with his superiors. We asked the following two questions relevant to this concern:

In general, how much influence do you think the following groups or persons have in determining the curriculum of this school building?

	no infl.	a little infl.	some infl.	a great deal of infl.	very great deal of infl.
Your superin- tendent					
Your principal					

In your opinion, how much influence should each of these groups or persons have in determining the curriculum of this school building?

	no infl.	a little infl.	some infl.	a great deal of infl.	very great deal of infl.
Your superin- tendent					
Your principal					

These questions suggest the following hypotheses:

Hypothesis 24: Staffs in which teachers perceive their principal as having more influence in the curriculum, relative to his superiors, will innovate more than staffs which perceive their principal as having less upwards influence.

Hypothesis 25: Staffs in which teachers feel their principal should have more influence than his superiors, will innovate more than staffs which feel their principal should have less upwards influence.

Hypothesis 26: Staffs in which teachers perceive their principal as supporting innovation and feel the principal should have more power, will innovate more than staffs which perceive either variable alone as important.

Another major variable in organizational relations is the quality of principal-staff congruence in the perception of staff behavior and relationships. Principals were asked to do the same task teachers did; they nominated staff members they felt were most influential and enthusiastic.

Please list numbers of the three teachers in this school who you feel are most influential in developing staff opinion about what is "good" and "poor" teaching.

Please list numbers of the three teachers in this school who you feel demonstrate most enthusiasm about new approaches to teaching.

These questions lead us to the following hypothesis:

Hypothesis 27: Principals who are more congruent with their staff's nominations on sociometric instruments regarding influence and enthusiasm will have staffs with more innovation than principals who are less congruent.

There were also attempts to collect data on the ways in which principals reported their own role priorities and behavior. All principals were asked to prioritize, into thirds, nine statements about their role behavior.

- ___ a. Offer constructive suggestions to teachers dealing with their problems.
- ___ b. Maximize the different skills found in the faculty in order to have teachers share resources.
- ___ c. Direct a smooth running organization.
- ___ d. Be well respected by supervisors.
- ___ e. Openly support creative teaching efforts.
- ___ f. Remind teachers about fulfilling school regulations.
- ___ g. Show teachers I know what's going on in classrooms in the school.
- ___ h. Don't approach teachers about the way they run their classes unless asked.
- ___ i. Demonstrate a warm personal interest in staff members.

Some of these statements ask about principal roles in encouraging openly innovative teaching and problem solving; others focus more directly on controlling and administrative functions. Statements C, D and F constitute an index emphasizing traditional administrative

concerns; statements B, G and I emphasize the management of interpersonal relations; and A, E and H emphasize professional growth concerns. With regard to these concerns we hypothesize:

Hypothesis 28: Those principals who place greater priority upon those role behaviors having to do with interpersonal and professional relations will have staffs with more innovation than principals who place priority upon traditional administrative and regulatory activities.

Principals were also asked whether they themselves were thinking about new approaches, and ways to bring new approaches to their teachers' attention. To the extent that principals will vary in this regard, we may expect that:

Hypothesis 29: Principals who are themselves trying innovations with regard to teacher professional sharing are likely to have staffs with more innovations than principals who are not so innovating.

CHAPTER IV

INNOVATIONS AND INNOVATORS

In chapters four and five we present data relevant to the hypotheses developed in Chapter III. Our central concern in the next two chapters is to discover what personal, interpersonal and/or organizational factors seem to explain why some teachers appear to be innovating in their classrooms and some do not. Although we have limited this study to an examination of these forces in elementary schools, where appropriate and useful we will present comparable data from the secondary schools sampled with the same instruments.

Measures of Innovation

The total population of teachers in the sixteen elementary schools we examined was 246. Of this total, 196 answered the question, "Are you trying any new, unusual or especially interesting practices for improving pupil mental health or learning?" Of the 196 responses, 112 teachers reported "yes," and 84 "no"; a self-reported innovation rate across all schools of 57%. Throughout this chapter, and elsewhere unless clearly specified otherwise, we treat a "no answer" as a non-response, and not a "no," to the self-report question concerning innovation.

The second self-report measure presented teachers with a list of 12 innovative practices and asked them to indicate which, if any, they were trying or had tried. On this measure, fully 92% of the 246

teachers reported one or more innovations. The frequency of practices reported by teachers on this question is presented in Table 2A.

Teachers were also asked to nominate others they knew were using new practices, and these peer nominations were potentially made on all teachers in the school, regardless of how they responded on the self-report items. A total of 143 teachers were nominated, and when computed on the basis of the total N we find a peer-reported innovation rate across all schools of 58%. The frequency of peer nominations received by teachers is presented in table 2B. In all reports of peer nominations, we indicate the number of colleagues nominating a teacher, regardless of the number of practices supporting each nomination.

In table 3 we compare the two self-report measures of innovation. The lack of a significant relation between these two measures is puzzling. It can best be explained by reconsidering the nature of the questions posed to teachers. In one case a list of practices was presented; thus, the concept of innovations was defined, and all that was asked for was a checkmark or a series of checkmarks. In the other case teachers were asked to supply their own meaning to an open-ended question, one which proceeded to ask for many details about the practice. The vague character of the second stimulus, compared to the first, may have deterred some teachers from responding fully.

Tables 4A and 4B demonstrate the relationships between the two self-report and the peer-report measures of the dependent variable. Table 4A indicates the lack of a significant relationship between the yes-no self-report and the peer-report. It is not reasonable that these two measures of innovation are unrelated, especially since one is a self-report and the other is a peer-report. The peer-report may be considered

TABLE 2A
FREQUENCY OF INNOVATIVE PRACTICES BY SELF-REPORT

Number of Practices	Number of Teachers	Percent of Teachers
0	20	08
1	1	00
2	13	05
3	24	10
4	32	13
5	27	11
6	34	14
7	25	10
8	29	12
9	21	09
10	8	03
11	7	03
12	5	02
	246	100

TABLE 2B
FREQUENCY OF INNOVATIVE PRACTICES BY PEER-REPORT

Number of Practices	Number of Teachers	Percent of Teachers
0	103	42
1	66	27
2	33	13
3	24	10
4	15	06
5	3	01
6	2	01
	246	100

TABLE 3
COMPARISON OF TWO SELF-REPORT MEASURES OF INNOVATION

Self-Report by Number of Practices	Self-Report by Yes-No		
	No	Yes	Total
	(N=85)	(N=109)	(N=194)
0 - 5	51%	49%	(N=91)
6 or more	38%	62%	(N=103)

$$\chi^2 = 3.13; \text{ NS}$$

TABLE 4A

SELF-REPORT (YES-NO) MEASURE OF INNOVATION RELATED TO
PEER-REPORT OF INNOVATION

A. Self-Report By Yes-No	Peer-Reported Innovation			
	0	1	2 or more	Total
	(N=77)	(N=54)	(N=60)	(N=191)
No	44%	46%	55%	(N=82)
Yes	56%	54%	45%	(N=109)

$$\chi^2 = .83; \text{ NS}$$

TABLE 4B

SELF-REPORT (NUMBER OF PRACTICES) MEASURE OF INNOVATION
RELATED TO PEER-REPORT OF INNOVATION

B. Self-Report by Number of Practices	Peer-Reported Innovation			
	0	1	2 or more	Total
	(N=103)	(N=66)	(N=77)	(N=246)
0 - 5	50%	24%	26%	(N=117)
6 or more	34%	29%	36%	(N=129)

$$\chi^2 = 6.86; p < .05$$

as the public visibility of real or imagined innovation, while a self-report may be the reflection of what goes on in the privacy of a single classroom. Clearly the possibility exists that teachers may be teaching in ways their colleagues are unaware, or that one teacher may consider what he is doing as an innovation and his colleagues may see it as "old hat." Of course, the reverse may be true as well.

Table 4B demonstrates a significant relation between the number of self-reported innovations and the number of peer-reported innovations. Both this self-report measure and the peer-report questions appeared on the same page, and both utilized the same list of innovative practices as the stimuli for teacher response. This may help to explain why one and not both self-reports are related to the peer-report. That this relation is not even more highly significant may be accounted for by the above noted difference between statements about personal behavior and the visibility of this behavior to peers.

The lack of highly significant relations among these measures of the dependent variable cast some doubt on the meaning and validity of these measures of innovation. As we present findings we will attempt to specify this meaning by using two different measures; the self-report yes-no and the peer-report. Wherever the alternative self-report measure indicates significantly different findings we will present that, too. In all cases we have computed the relations between the independent and dependent variables comparing a high-high group and a low-low group of innovating teachers. A high-high group consists of teachers high on both self- and peer-reports of innovation; a yes or six or more practices on the self-reports and two or more peer nominations. A low-low group consists of teachers reporting no or less than six practices on the self-report and receiving no peer nominations.

These analytic alternatives will only be presented when they tend to contradict or elaborate the primary tables and findings.

Teacher Characteristics and Innovation

The data indicate that both of the first two hypotheses, those regarding the relationships between sex and age and innovation are not confirmed. The sex or age of teachers does not significantly relate to the teacher's own report or his peers' report of innovative practice.

The relationships among the variables in tables 5A and 5B are not statistically significant, at least partly due to the minimal split in the population on the sex variable. Fully 92% of the teachers are females, and the differences that appear are not large enough to approach a level of statistical significance. Although the population is not as distorted with respect to age, the trend toward older teachers reporting more innovations also does not reach acceptable levels of statistical significance in tables 6A and 6B.

The data relevant to the third hypothesis, which suggests a positive relationship between advanced educational training and innovation, are presented in tables 7A and 7B. It is clear from table 7A that teachers' level of educational training is not related to self-report of innovation. Whether the self-report is in a yes-no form, or in the form of the number of practices reported makes no difference. However, in the case of the peer-reports, in table 7B, the teachers' level of education is positively and significantly related to nominations for innovation ($p < .05$). The examination of high-high and low-low groups is of particular interest in this situation. When high and low innovation groups are constructed on the basis of the convergence of self and peer nominations, significantly positive relations between high

TABLE 5A
SEX RELATED TO SELF-REPORT OF INNOVATION

Sex	Self-Reported Innovation		
	No	Yes	Total
	(N=81)	(N=108)	(N=189)
Male	50%	50%	(N=16)
Female	42%	58%	(N=173)

$$\chi^2 = .34; \text{ NS}$$

TABLE 5B
SEX RELATED TO PEER-REPORT OF INNOVATION

Sex	Peer-Reported Innovation			
	0	1	2 or more	Total
	(N=96)	(N=65)	(N=74)	(N=235)
Male	37%	21%	42%	(N=19)
Female	41%	28%	31%	(N=216)

$$\chi^2 = 1.14; \text{ NS}$$

TABLE 6A
AGE RELATED TO SELF-REPORT OF INNOVATION

Age	Self-Reported Innovation		
	No	Yes	Total
	(N=79)	(N=101)	(N=180)
45 or less	49%	51%	(N=117)
46 or more	35%	65%	(N=63)

$$\chi^2 = 3.21; \text{ NS}$$

TABLE 6B
AGE RELATED TO PEER-REPORT OF INNOVATION

Age	Peer-Reported Innovation			
	0	1	2 or more	Total
	(N=92)	(N=59)	(N=70)	(N=221)
45 or less	42%	26%	32%	(N=142)
46 or more	42%	28%	30%	(N=79)

$$\chi^2 = .12; \text{ NS}$$

TABLE 7A
EDUCATIONAL LEVEL RELATED TO SELF-REPORT OF INNOVATIONS

Education	Self-Reported Innovation		
	No	Yes	Total
	(N=81)	(N=107)	(N=188)
B.A. + 15 credits	45%	55%	(N=136)
B.A. + more than 15 credits	38%	62%	(N=52)

$$\chi^2 = .61; NS$$

TABLE 7B
EDUCATIONAL LEVEL RELATED TO PEER-REPORT OF INNOVATIONS

Education	Peer-Reported Innovation			Total
	0	1	2 or more	
	(N=97)	(N=64)	(N=74)	(N=235)
B.A. + 15 credits	46%	28%	26%	(N=169)
B.A. + more than 15 credits	30%	24%	45%	(N=66)

$$\chi^2 = 8.58; p < .05$$

innovation and advanced educational training are indicated ($p < .05$). Once again, this relationship is significant regardless of which self-report measure is combined with the peer-report measure to form polarized groups. Table 8 presents the findings using the yes-no self-report combined with the peer-report for the dependent variable groupings. The discrepancy between tables 7A and 7B are difficult to account for. It may be that knowledge of a teacher's educational training has some influence on the peer-reported nominations. If teachers with more advanced training are more visible in the school, they may be more likely to be seen as expert and to be nominated. The added weight of the findings in Table 8 provides us with grounds for a partial and cautious acceptance of hypothesis 3.

The data in tables 9A and 9B demonstrate the relationship between a teacher's years of experience and innovation. The fourth hypothesis suggests a positive relationship between these variables. In table 9A it is clear that years of teaching experience is significantly related to self-reported innovation. But table 9B demonstrates no such clear relation between teaching experience and peer-reported innovation. When high-high and low-low innovation groups are compared, they show no significant relation between experience and innovation.

It could be argued that teachers who have a good deal of experience feel confident enough to announce their innovative efforts themselves. This interpretation might account for the significance of table 9A, but it does not adequately explain why peer-reports should fail here, while being positively related to educational level. Another possible interpretation is that educational training is a more visible characteristic than teaching experience, and thus more likely to be related to peer-reports.

TABLE 8
COMPARISON OF HIGH-HIGH AND LOW-LOW INNOVATION GROUPS ON
TEACHERS' LEVEL OF EDUCATION

Education	Innovation Group		
	High-High	Low-Low	Total
	(N=34)	(N=36)	(N=70)
B.A. and 15 Credits	57%	43%	(N=47)
B.A. and More Than 15 Credits	30%	70%	(N=23)

$$\chi^2 = 4.57; P < .05$$

TABLE 9A
TEACHING EXPERIENCE RELATED TO SELF-REPORT OF INNOVATION

Years Teaching Experience	Self-Reported Innovation		
	No	Yes	Total
	(N=79)	(N=107)	(N=186)
1 - 3 Years	50%	50%	(N=66)
4 - 12 Years	49%	51%	(N=55)
More than 13 Years	29%	71%	(N=65)

$$\chi^2 = 7.17; p. < .05$$

TABLE 9B
TEACHING EXPERIENCE RELATED TO PEER-REPORT OF INNOVATION

Years Teaching Experience	Peer-Reported Innovation			Total
	0	1	2 or more	
	(N=97)	(N=63)	(N=74)	(N=234)
1 - 3 Years	47%	31%	22%	(N=78)
4 - 12 Years	39%	23%	38%	(N=71)
More than 13 Years	38%	27%	35%	(N=85)

$$\chi^2 = 6.23; NS$$

It is important to remember that this study is concerned with elementary schools and that we have been reporting data from elementary school teachers. Several markedly different and provocative phenomena appear when we consider secondary school teachers. Data from secondary school teachers comparable to tables 5A, 6A, 7A and 9A for elementary teachers are presented in table 10.

In the first place, it is clear that secondary school teachers are more often males than are elementary teachers; 61% of secondary as compared with 8% of elementary teachers are male. Further, secondary school teachers also seem to be younger, generally with more educational training and less teaching experience. Although most of these background variables are not significantly related to self-reported innovation, teaching experience is. But it is negatively related; those teachers with less experience seem to be more innovative in secondary schools. Moreover, the trends with regard to age and education are also in the opposite direction in these schools.

These two quite different populations must also be affected by the different tasks and status rewards at different instructional levels. The subject matter and disciplinary focus of contemporary high schools may place a higher priority upon advanced content training prior to recruitment. Since some studies suggest that high school teaching is a higher status occupation than elementary school teaching (Charters, 1963), it seems appropriate that career-oriented males should gravitate toward high schools. At the very least, these data and subsequent interpretations suggest there may be some very different professional styles and norms for secondary as distinguished from elementary school teachers.

TABLE 10

BACKGROUND CHARACTERISTICS RELATED TO SELF-REPORT OF
INNOVATION FOR SECONDARY SCHOOL TEACHERS

Background		Self-Reported Innovation		
		No	Yes	Total
		(N=76)	(N=137)	(N=213)
A. Sex				
	Male	40%	60%	(N=120)
	Female	34%	66%	(N=93)
		(N=73)	(N=134)	(N=207)
B. Age				
	45 and under	33%	67%	(N=172)
	Over 46	46%	54%	(N=35)
		(N=76)	(N=136)	(N=212)
C. Education				
	B.A. and 15 Credits	32%	68%	(N=137)
	B.A. and More Than 15 Credits	43%	57%	(N=75)
		(N=75)	(N=135)	(N=210)
D. Teaching Experience				
	Less Than 3 Years	27%	73%	(N=85)
	4 - 12 Years	38%	62%	(N=89)
	More Than 13 Years	50%	50%	(N=36)

$\chi^2_A = 2.24; NS$ $\chi^2_B = 2.05; NS$ $\chi^2_C = 2.31; NS$ $\chi^2_D = 6.18; p > .05$

We now turn to the consideration of certain teacher attitudinal variables hypothesized to be related to innovation. Contrary to our expectations in hypothesis 5, the data in tables 11A and 11B indicate that the degree of self-determination a teacher feels he has in his classroom is not related to his own or peers' report of innovation. The population is heavily skewed in the direction of a very high degree of autonomy on this variable, with 58% of the population selecting the most extremely positive of the five response categories, "a very great deal of influence." However, the skew alone does not explain the failure of this variable to be positively related to either self-report or peer-report of innovation, since there are quite minimal differences among the rest of the population. It may well be that classroom autonomy is a neutral factor in innovation; it may permit innovators as well as non-innovators to go about their business any way they wish.

The sixth hypothesis is concerned with teachers' estimates about the amount of power they felt they had in the determination of local educational policy. This hypothesis, is supported by the self-report data presented in table 12A. Although a significantly positive relation exists in table 12A, the data in table 12B do not support the hypothesis. The minor trend in this table is not statistically significant and high-high and low-low group analyses also are non-significant. It seems that teachers' personal feelings are related to self-report of innovation, but when any peer-report data are added, these feelings are no longer related to innovation. Peers are not likely to know how much influence a teacher feels he has, and so may not be expected to produce as clear a relationship between influence and innovation. Once again, we are confronted with the distinction

TABLE 11A

THE AMOUNT OF INFLUENCE IN OWN CLASSROOM RELATED
TO SELF-REPORT OF INNOVATION

Influence	Self-Reported Innovation		
	No	Yes	Total
	(N=77)	(N=107)	(N=184)
Moderate	44%	56%	(N=79)
Very Great	40%	60%	(N=105)

$$\chi^2 = .37; \text{ NS}$$

TABLE 11B

THE AMOUNT OF INFLUENCE IN OWN CLASSROOM RELATED
TO PEER-REPORT OF INNOVATION

Influence	Peer-Reported Innovation			
	0	1	2 or more	Total
	(N=95)	(N=62)	(N=71)	(N=228)
Moderate	47%	23%	29%	(N=95)
Very Great	37%	30%	32%	(N=133)

$$\chi^2 = 2.37; \text{ NS}$$

TABLE 12A

THE AMOUNT OF INFLUENCE IN DETERMINING CURRICULUM
RELATED TO SELF-REPORT OF INNOVATION

Amount of Influence	Self-Reported Innovation		
	No	Yes	Total
	(N=78)	(N=102)	(N=180)
None or Little	55%	45%	(N=75)
Some or Great Deal	35%	65%	(N=105)

$$\chi^2 = 6.75; p < .01$$

TABLE 12B

THE AMOUNT OF INFLUENCE IN DETERMINING CURRICULUM
RELATED TO PEER-REPORT OF INNOVATION

Amount of Influence	Peer-Reported Innovation			
	0	1	2 or more	Total
	(N=92)	(N=60)	(N=69)	(N=221)
None or Little	45%	28%	26%	(N=88)
Some or Great Deal	39%	26%	35%	(N=133)

$$\chi^2 = 1.83; NS$$

between self-report of innovation and visibility of these innovations to peers.

A similar situation arises in the findings relevant to hypothesis 7. According to this hypothesis we expected that the discrepancy between the amount of influence a teacher felt he had and felt he should have would be negatively related to innovation. In other words, the smaller a discrepancy between felt and desired influence, the more a teacher is expected to innovate. Tables 13 A and 13B present these data. These tables indicate the same pattern found in tables 12A and 12B; a positive and significant relation between low discrepancy and self-reported innovation, but an insignificant relation with peer-reported innovation.

If we accept the findings of these two significant self-reported relationships, it would appear that teachers who felt they could and did have the power to influence school curriculum more often report innovations. It also seems that those teachers who feel satisfied with the influence they have, in other words, those for whom there is minimal discrepancy between their felt and desired power, are more likely to innovate than teachers who either feel they have little influence or not as much influence as they desire. However, it is also clear that these relationships only hold for self-report data, and when peer-reported innovations are utilized as the criterion for innovation these relationships disappear.

Teacher Peer Relations and Innovation

In addition to the relevance of personal background factors and feelings about influence in determining the character of local policy, the peer relations between teachers also has been suggested as an

TABLE 13A

DISCREPANCY BETWEEN FELT AND DESIRED INFLUENCE
RELATED TO SELF-REPORT OF INNOVATION

Discrepancy	Self-Reported Innovation		
	No	Yes	Total
	(N=78)	(N=100)	(N=178)
None*	39%	61%	(N=74)
Desired is Slightly Greater Than Felt	39%	61%	(N=70)
Desired is Much Greater Than Felt	65%	35%	(N=34)

$$\chi^2 = 7.46; p < .05$$

TABLE 13B

DISCREPANCY BETWEEN FELT AND DESIRED INFLUENCE
RELATED TO PEER-REPORT OF INNOVATION

Discrepancy	Peer-Report Innovation			Total
	0	1	2 or more	
	(N=91)	(N=58)	(N=69)	(N=218)
None*	43%	23%	34%	(N=96)
Desired is Slightly Greater Than Felt	40%	29%	30%	(N=82)
Desired is Much Greater Than Felt	43%	30%	28%	(N=40)

$$\chi^2 = 1.37; NS$$

* Includes six cases where felt is slightly greater than desired.

important factor influencing classroom innovation. Since the latter is a feature of innovative processes and educational systems that is often overlooked and inadequately researched, our hope is to discover some findings to open up this area of inquiry.

The first aspect of staff peer relations investigated was the relation between teachers' perceptions of the map of staff relations and classroom innovation. The data in table 14A contradicts our expectation in hypothesis 8 that there would be no relationship. The original question presented five different response alternatives; one large group, one large group plus several isolates, two large groups, two large groups plus two isolates, and a series of small groups. It is only when all groups are collapsed into two categories that the map chosen becomes significantly related to self-reported innovation. Then teachers who saw their staff organized into one large cohesive group reported more innovation. It is clear that this relationship only holds for self-reported innovation; the findings are insignificant for peer-reported nominations in table 14B. The examination of high-high and low-low groups of innovators also does not show a significant relationship between the map chosen and innovativeness.

It is interesting to compare the elementary and secondary school teachers in the way they respond to these staff maps. Whereas 35% of the elementary school teachers perceived their staff as a collection of dyads and triads and 33% perceived them as a single cohesive unit, 55% of the secondary school teachers saw their staffs as a collective of dyads and triads and 12% saw them as cohesive units. These different perceptions probably quite effectively reflect the differing organization of instruction in these schools. Secondary schools are highly

TABLE 14A

PERCEPTION OF DIAGRAM OF STAFF RELATIONSHIPS RELATED
TO SELF-REPORT OF INNOVATION

Diagram Chosen	Self-Reported Innovation		
	No	Yes	Total
	(N=76)	(N=98)	(N=174)
One Group	33%	67%	(N=58)
All Others	49%	51%	(N=116)

$$\chi^2 = 4.17; p < .05$$

TABLE 14B

PERCEPTION OF DIAGRAM OF STAFF RELATIONSHIPS RELATED
TO PEER-REPORT OF INNOVATION

Diagram Chosen	Peer-Reported Innovation			Total
	0	1	2 or more	
	(N=87)	(N=58)	(N=61)	(N=206)
One Group	49%	23%	28%	(N=65)
All Others	39%	30%	30%	(N=141)

$$\chi^2 = 2.06; NS$$

organized along departmental lines which encourage small group formations. In addition, the size of the secondary schools is considerable greater than the elementary schools, further stimulating cliques and sub-groups. In both groups of schools, however, the greatest percentage of innovation was reported by teachers perceiving the social system as united and cohesive, although this relationship does not approach statistical significance in the secondary schools.

Hypothesis 9 suggests that teachers who utilize these staff maps to place themselves in dyads or triads should innovate more than their colleagues. The data in tables 15A and 15B indicate no important differences in reported innovation among teachers who see themselves in a variety of staff groupings. Most teachers (62%) placed themselves on the periphery of large staff clusters. Self-placement in a triad was second most common, then in the center of a large cluster, and finally in dyads or isolated. Neither measure of innovation is significantly related to such self-placement.

Teachers were asked to enumerate the professional sources from which they would solicit help in dealing with problems of classroom management. Contrary to our expectations in hypothesis 10, it is clear that teachers who perceive a greater number of potential staff resources do not innovate more often than teachers who perceive fewer aids. These data are presented in tables 16A and 16B. It may be that with regard to staff resources, as with staff diagrams, the peer supports and alignments a teacher sees himself connected to are not relevant influences on classroom practice. Personal feelings of efficacy and influence may be more important than judgments of the availability of peer resources and affiliations.

TABLE 15A
PERCEIVED POSITION IN STAFF SOCIAL DIAGRAM RELATED
TO SELF-REPORT OF INNOVATION

Position	Self-Reported Innovation		
	No	Yes	Total
	(N=80)	(N=107)	(N=187)
Isolate	45%	55%	(N=11)
Dyad	27%	73%	(N=11)
Triad	54%	46%	(N=26)
Periphery of Group	42%	58%	(N=115)
Center of Group	42%	58%	(N=24)

$$\chi^2 = 2.49; \text{ NS}$$

TABLE 15B
PERCEIVED POSITION IN STAFF SOCIAL DIAGRAM RELATED
TO PEER-REPORT OF INNOVATION

Position	Peer-Reported Innovation			Total
	0	1	2 or more	
	(N=91)	(N=62)	(N=68)	(N=221)
Isolate	43%	14%	43%	(N=14)
Dyad	54%	31%	15%	(N=13)
Triad	47%	23%	30%	(N=30)
Periphery of Group	40%	25%	35%	(N=134)
Center of Group	37%	50%	13%	(N=30)

$$\chi^2 = 13.27; \text{ NS}$$

TABLE 16A
SOURCES OF HELP RELATED TO SELF-REPORT OF INNOVATION

Number of Sources	Self-Reported Innovation		
	No	Yes	Total
	(N=82)	(N=109)	(N=191)
0 and 1	42%	58%	(N=132)
2 and 3	44%	56%	(N=59)

$$\chi^2 = .1; \text{ NS}$$

TABLE 16B
SOURCES OF HELP RELATED TO PEER-REPORT OF INNOVATION

Number of Sources	Peer-Reported Innovation			
	0	1	2 or more	Total
	(N=103)	(N=66)	(N=77)	(N=246)
0 and 1	42%	27%	31%	(N=176)
2 and 3	41%	26%	33%	(N=70)

$$\chi^2 = .12; \text{ NS}$$

The next series of tables present findings which generally support hypotheses 11, 12 and 13. These hypotheses suggest that teachers most highly nominated as sociometric leaders with regard to communication, influence on teaching and enthusiasm about new approaches to teaching will be most likely to innovate.

While the data on self-report of innovation in table 17A are not statistically significant, there is a clear trend for teachers nominated as high communicants to more often report innovating. When high-high and low-low innovation groups are compared, high communicants demonstrate significantly more innovation than low communicants ($p. < .01$). The trend in table 17A becomes clearly significant in tables 18A and 19A, where teachers nominated as highly influential about school policy or highly enthusiastic about new teaching more often report innovation than those teachers not nominated or only minimally nominated. It is of course not clear what the direction of cause and effect is in these associations between peer sociometric choice and self-report of innovation. It may be that popular, influential and enthusiastic teachers are ready to take the risks of innovating new teaching practices. Or, it may be that innovative teachers are seen by their colleagues as good people to seek out, as people to listen and defer to, and as persons to learn from.

The trend in the self-report data of table 17A, and the significant findings in tables 18A and 19A, become even more potent and significant when peer reports are used as criteria for innovation. Peer selection as high communicant, high influencer or highly enthusiastic are all positively and significantly related to peer-reports of innovation presented in Tables 17B, 18B and 19B. It could be argued that once a respondent starts to make sociometric choices he makes few distinctions and all sociometric indices, including peer nominations for innovation,

TABLE 17A
NOMINATIONS ON COMMUNICATION RELATED TO
SELF-REPORT OF INNOVATION

Communication Nomination	Self-Reported Innovation		
	No	Yes	Total
	(N=82)	(N=109)	(N=191)
Low	48%	52%	(N=112)
High	35%	65%	(N=79)

$$\chi^2 = 3.07; \text{NS}$$

TABLE 17B
NOMINATIONS ON COMMUNICATION RELATED TO
PEER-REPORT OF INNOVATION

Communication Nomination	Peer-Reported Innovation			Total
	0	1	2 or more	
	(N=103)	(N=66)	(N=77)	(N=246)
Low	55%	26%	19%	(N=144)
High	24%	28%	48%	(N=102)

$$\chi^2 = 29.80; p < .01$$

TABLE 18A

NOMINATIONS OF INFLUENCE RELATED TO SELF-REPORT OF INNOVATION

Influence Nominations	Self-Reported Innovation		
	No	Yes	Total
	(N=82)	(N=109)	(N=191)
Low	54%	46%	(N=92)
High	32%	68%	(N=99)

$$\chi^2 = 9.43; p < .01$$

TABLE 18B

NOMINATIONS OF INFLUENCE RELATED TO PEER-REPORT OF INNOVATION

Influence Nominations	Peer-Reported Innovation			Total
	0	1	2 or more	
	(N=103)	(N=66)	(N=77)	(N=246)
Low	57%	24%	19%	(N=120)
High	28%	29%	43%	(N=126)

$$\chi^2 = 24.01; p < .01$$

TABLE 19A

NOMINATIONS ON ENTHUSIASM RELATED TO SELF-REPORT OF INNOVATION

Enthusiasm Nominations	Self-Reported Innovation		
	No	Yes	Total
	(N=82)	(N=109)	(N=191)
Low	56%	44%	(N=108)
High	27%	73%	(N=83)

$$\chi^2 = 16.09; p < .01$$

TABLE 19B

NOMINATIONS ON ENTHUSIASM RELATED TO PEER-REPORT OF INNOVATION

Enthusiasm Nominations	Peer-Reported Innovation			Total
	0	1	2 or more	
	(N=103)	(N=66)	(N=77)	(N=246)
Low	56%	28%	16%	(N=139)
High	23%	25%	51%	(N=107)

$$\chi^2 = 40.10; p < .01$$

are measuring the same thing. Such an argument normally would make us cautious about interpreting the results of tables 17B, 18B and 19B. But no such problem exists with regard to the variable relations in tables 18A and 19A, where self-report of innovation is related to peer nominations on influence and enthusiasm. The convergent findings of these six tables strongly support our confidence in the hypothesized relationship between innovative teaching and a variety of professional leadership dimensions.

In summary, in this chapter we reviewed the problems involved in establishing the validity of the dependent variable. Several measures were compared, and self-report Yes-No and peer-report of innovation were selected for primary use in these tables. A number of teacher background characteristics and attitudinal variables were examined; educational level, teaching experience and felt and desired influence appear to be positively and significantly related to one or more of the dependent variable measures. Several variables relevant to teacher peer relations also were examined; perception of the staff as a cohesive unit and being nominated by peers as a high communicant, as highly influential, and as highly enthusiastic about new approaches to teaching appear to be positively and significantly related to one or more of the measures of innovation.

CHAPTER V

SCHOOL ORGANIZATIONAL CHARACTERISTICS AND INNOVATION

In this chapter we consider some of the extra-individual variables that seem to be relevant to an understanding of innovation in the classroom. Essentially, we will be seeking to organize teachers' perceptions about the character of their school into a common perception and to see how those common perceptions relate to the degree of innovation among staff members in a school. In some cases we have asked teachers to stipulate how they see the social structure of their local organization, and other cases how they characterize and interpret their principal's concerns and behavior.

Measures of School Innovation

As the major dependent variable measures we have computed the percentage of teachers in a school who answer the question regarding their own teaching by reporting that they have innovated, and the percentage of teachers in a school nominated by their peers as innovators. The percentage and rank of each school on these measures is shown in Table 20.

The self-report school percentage of innovation varies from a low of 13% to a high of 91%. Five schools show a self-reported innovation index, thus computed, of 50% or less, with the remaining 11 schools showing more than 50%. The median innovation index is 56.5%, and the mean is 60.2%, with a standard deviation of 20.3%. If the innovation percentages are computed on the basis of all teachers, even

TABLE 20
PERCENT INNOVATION AND RANK BY SCHOOL

School	Percent Self- Reported Innovation (Yes-No)	Rank Self- Reported Innovation	Mean Percent Peer-Reported Innovation	Rank Peer- Reported Innovation
01	64	10	10.7	13
02	82	14	2.7	3
03	54	6	7.8	9
04	57	8.5	9.4	10
05	91	16	.9	1
06	50	4	22.1	16
07	80	13	2.8	4
08	83	15	19.1	15
09	73	11.5	3.7	7
10	50	4	9.6	11
11	57	8.5	3.4	6
12	30	2	6.9	8
13	50	4	10.0	12
14	73	11.5	11.1	14
15	56	7	2.6	2
16	13	1	3.3	5

those who did not answer the self-report innovation question, the range extends from 8% to 75%. The median in this case drops to 51.5%, the mean to 47.5%, and the standard deviation to 18%. There are some cases in this chapter where we use the total school population in findings and tables, regardless of whether teacher self-report response was "yes," "no," or "no response." This is largely the case when we examine the sociometric nominations, which include choices of total school population and necessitates the same procedures for deriving a school measure of innovativeness. In no case does this use of "no response" change the results in any table.

The number of teachers receiving any peer nominations for innovation in a school are divided by the total number of teachers in the school. The outcome is a school index of the mean percent of peer-reported innovation. This index per school ranges from .9% to 22.1%. The median is 7.35%, the mean is 7.9%, and the standard deviation is 6.0%.

Another self-report innovation index was computed by averaging, throughout each school, the number of practices all teachers reported they were using or had used. There was very little variation on this measure, with the school range extending from 3.9 practices to 7.0 practices.

The rankings of all schools on these three measures were correlated to give some indication of their relation to one another. These data are presented in table 21. None of the Spearman rho coefficients of correlation in this table are statistically significant, establishing the virtual independence of the measures. Following the procedure adopted in chapter IV, we will report both self-report Yes-No and peer-report data on innovation in all tables. Other self-report data will be used only when it would contradict or elaborate these primary findings.

TABLE 21
CORRELATIONS AMONG THREE RANKINGS OF SCHOOL INNOVATION INDICES

	Self-Report Yes-No	Self-Report Practices
Self-Report Number of Practices	+ .31	
Peer-Report	- .19	+ .09

Regardless of which measures are used, the size of the ranges and standard deviations of these indices, combined with the relatively small N of sixteen schools, suggest it will be difficult to produce statistically significant findings at the organizational level of analysis.

In comparing schools in the following tables we make principal use of the Mann-Whitney test. Hayes (1963; p. 633), considers this a "powerful alternative to the usual T test," and especially useful when some of the assumptions for the latter are not met. It is particularly appropriate here because there is not a normal distribution of the innovation percentage among these sixteen schools.

The Peer Social Structure and Innovation

Chapters II and III discuss the potential potency of the staff peer structure in certain areas of professional performance. In this section we review aspects of the sociometric choice structure and of shared attitudes and values as they may influence classroom innovation.

Hypothesis 14 suggests that there will be more innovation in schools where the three sociometric patterns are highly correlated than where they are not. Table 22 presents data relevant to this hypothesis. These data indicate there is no major difference in innovation between schools where either the communication or influence sociometric was unrelated to the enthusiasm sociometric. There were only three schools where none of the sociometric patterns were highly related, too small a sample for our use. As a result, this hypothesis was modified slightly to be tested.

Despite the failure of hypothesis 14 to conform to our expectations, let us review the findings relevant to the next, related, hypothesis. Hypothesis 15 suggests that in those schools with low sociometric

TABLE 22
CORRELATION OF SOCIOMETRIC PATTERNS RELATED TO SELF-REPORT AND
PEER-REPORT OF INNOVATION

Innovation Measure	Schools With High Correlations (N = 7)	Schools With Low Correlations (N = 9)
A. Self-Reported Innovation*		
Mean Percent	50.4	45.3
Sum or Ranks	76	69
	U = 24; NS	
B. Peer-Reported Innovation		
Mean Percent	06.3	09.1
Sum of Ranks	56	80
	U = 28; NS	

* In this table the dependent variable is computed on the basis of all teachers in the school, regardless of whether or not they answered the innovation question. $(\text{Innovation} = \frac{\text{yes}}{\text{yes} + \text{No} + \text{NA}})$

correlations, hypotheses 4, 5 and 6 will be reversed. That is, in those schools teachers with less teaching experience, and teachers who feel they have less autonomy and less influence will innovate more. Only the self-report portions of hypotheses 4 and 6 were upheld in chapter IV, so we limit this test to these two hypotheses. The data indicate, in tables 23 and 24, that hypothesis 15 is not confirmed. Hypothesis 4 continues to be upheld at an acceptable level of statistical significance; if anything, the relationship appears to be stronger under these new conditions. It does not reverse as expected. Hypothesis 6 is no longer upheld as statistically significant, although the major trend of the data does not appear to reverse as expected.

It may be concluded quite firmly, then, that the existence of high or low intercorrelations among the sociometric structures in a school is not a major influence upon teacher innovation. It would appear from Chapter IV, that being highly chosen on any dimension is more important than the relations among those dimensions in these schools we have sampled.

Hypothesis 16 suggests that a staff level mean of the kinds of feelings expressed in hypothesis 5 should be related to the degree of innovation in schools. That is, in those schools where the staff feels more autonomy in their own classroom style there will be more innovation. Since hypothesis 5 was not upheld, we are not surprised to see hypothesis 16 fail in table 25. However, it is surprising to see such a strong trend, although non-significant, in the non-predicted direction. The mean percentage innovation in schools with staff feelings of relatively high autonomy is 50.9%, and in schools where the staff feels lower autonomy 69.5%. Far from suggesting that autonomy

TABLE 23

RELATION BETWEEN YEARS OF EXPERIENCE AND SELF-REPORT OF INNOVATION
IN SCHOOLS WHERE SOCIOMETRIC PATTERNS ARE NOT RELATED

Years Experience	Self-Reported Innovation		
	No	Yes	Total
	(N=40)	(N=51)	(N=91)
1 - 3 years	50%	50%	(N=32)
4 - 12 years	56%	44%	(N=34)
More than 13 years	20%	80%	(N=25)

$$\chi^2 = 8.25; p < .05$$

TABLE 24

RELATION BETWEEN AMOUNT OF INFLUENCE IN DETERMINING CURRICULUM AND
SELF-REPORT OF INNOVATION IN SCHOOLS WHERE
SOCIOMETRIC PATTERNS ARE NOT RELATED

Amount of Influence	Self-Reported Innovation		
	No	Yes	Total
	(N=40)	(N=48)	(N=88)
Moderate	53%	47%	(N=43)
Very great	38%	62%	(N=45)

$$\chi^2 = 2.25; NS$$

TABLE 25

STAFF AUTONOMY RELATED TO SELF-REPORT AND PEER-REPORT OF INNOVATION

Innovation Measure	Schools With High Autonomy (N = 8)	Schools With Low Autonomy (N = 8)
A. Self-Reported Innovation		
Mean Percent	50.9	69.5
Sum of Ranks	54	82
	U = 18; NS	
B. Peer-Reported Innovation		
Mean Percent	07.6	08.1
Sum of Ranks	64	72
	U = 28; NS	

is irrelevant, the trend in these data suggests that more innovation might occur in schools characterized by low autonomy. Of course, due to the skew of responses on this item, low autonomy really means teachers feel "some" or "a great deal" of influence over classroom style as opposed to "a very great deal." Another interpretation of these data may lie in the character of reported innovations. Although some practices are indeed invented by teachers and are adopted by others in a bottom-up fashion; others may be suggested by principals or administrators and adopted from the top-down. Especially in the latter case, a staff with minimal feelings of independence and autonomy in their teaching styles would be most likely to use innovations. The validation of this interpretation cannot be undertaken here; it rests on an analysis of the type and source of the innovation.

Hypothesis 17 suggests that in buildings characterized by a higher degree of teacher feelings of influence on the curriculum there will be more innovation than in buildings where teachers feel they have less local influence. These data are presented in table 26. It is clear from this table that there are no important differences between the percentages of innovation and the rankings on innovativeness among schools with different staff feelings of influence. Moreover, as table 27 demonstrates, there are no important differences when we consider the degree of discrepancy between "felt" and "desired" influence in the staff. Hypothesis 18 suggests there would be a difference, and that staffs with the least discrepancy would innovate more. Table 27 clearly does not support this hypothesis.

The import of tables 26 and 27 is to suggest strongly that accumulated staff attitudes about influence do not relate to organizational innovativeness, even when those same attitudes, considered as

TABLE 26
STAFF FEELINGS OF INFLUENCE RELATED TO SELF-REPORT AND
PEER-REPORT OF INNOVATION

Innovation Measure	Schools With Staff Feelings Of High Influence (N = 7)	Schools With Staff Feelings Of Low Influence (N = 9)
A. Self-Reported Innovation		
Mean Percent	57.6	62.2
Sum of Ranks	55	73
	U = 27; NS	
B. Peer-Reported Innovation		
Mean Percent	07.3	08.3
Sum of Ranks	66	70
	U = 25; NS	

TABLE 27

STAFF DISCREPANCY BETWEEN FELT AND DESIRED INFLUENCE RELATED
TO SELF-REPORT AND PEER-REPORT OF INNOVATION

Innovation Measure	Schools With Low Discrepancy (N = 9)	Schools With High Discrepancy (N = 7)
A. Self-Reported Innovation		
Mean Percent	60.9	59.3
Sum of Ranks	82	54
	U = 26; NS	
B. Peer-Reported Innovation		
Mean Percent	07.8	08.0
Sum of Ranks	81	55
	U = 27; NS	

individual attributes, do relate to individual innovation. Does this mean that the accumulation of one's own and colleagues' attitudes does not influence one's behavior? Or does it mean that it may, but the mere averaging of individual choices is an inappropriate method, a construction of a "group mind"? Or does it mean that it may, but not with the variables considered here? The increasing potency of these questions will be deferred until we can examine the remaining organizational variables in this chapter.

Several hypotheses set out the expected relationship between structural aspects of the sociometric choice system and school innovativeness. Hypotheses 19, 20 and 21 all predict that the more diffuse the sociometric choice pattern on a variety of dimensions the higher will be the percentage of staff members innovating. We assessed the diffuseness or centrality of each school's sociometric pattern by examining the number of choices each teacher in that school received and computing the standard deviation of this choice distribution. The relations between this index of variance--where low variance indicates an evenly scattered choice system and high variance a system where several are highly chosen and several unchosen--and school innovativeness are presented in Tables 28, 29 and 30.

The data from these three tables are very clear in their non-confirmation of the three hypotheses; none of the tables of self-reported innovation suggest even a trend to the data. When the mean percent of self-reported innovation is computed, in no instance is there more than 2.1% difference between more diffuse and more central schools on any dimension. There are some trends in the peer-report data, but none of these approach statistical significance. The lack of noteworthy differences in these tables is a clear non-confirmation

TABLE 28
VARIANCE OF COMMUNICATION PATTERN RELATED TO SELF-REPORT
AND PEER-REPORT OF INNOVATION

Innovation Measure	Schools With Diffuse Pattern (N = 8)	Schools With Central Pattern (N = 8)
A. Self-Reported Innovation*		
Mean Percent	47.6	47.5
Sum of Ranks	71	65
	U = 29; NS	
B. Peer-Reported Innovation		
Mean Percent	05.6	11.0
Sum of Ranks	55	81
	U = 19; NS	

* In this table the dependent variable is computed on the basis of all teachers in the school, regardless of whether or not they answered the innovation question. $(\text{Innovation} = \frac{\text{Yes}}{\text{Yes} + \text{No} + \text{NA}})$

TABLE 29
VARIANCE OF INFLUENCE PATTERN RELATED TO SELF-REPORT
AND PEER-REPORT OF INNOVATION

Innovation Measure	Schools With Diffuse Pattern (N = 7)	Schools With Central Pattern (N = 9)
A. Self-Reported Innovation*		
Mean Percent	48.4	46.9
Sum of Ranks	59	47
	U = 31; NS	
B. Peer-Reported Innovation		
Mean Percent	08.6	07.3
Sum of Ranks	54	82
	U = 26; NS	

* In this table the dependent variable is computed on the basis of all teachers in the school, regardless of whether or not they answered the innovation question. $(\text{Innovation} = \frac{\text{Yes}}{\text{Yes} + \text{No} + \text{NA}})$

TABLE 30
VARIANCE OF ENTHUSIASM PATTERN RELATED TO SELF-REPORT
AND PEER-REPORT OF INNOVATION

Innovation Measure	Schools With Diffuse Pattern (N = 8)	Schools With Central Pattern (N = 8)
A. Self-Reported Innovation*		
Mean Percent	48.6	46.5
Sum of Ranks	69	67
	U = 31; NS	
B. Peer-Reported Innovation		
Mean Percent	09.7	06.0
Sum of Ranks	76	60
	U = 24; NS	

* In this table the dependent variable is computed on the basis of all teachers in the school, regardless of whether or not they answered the innovation question.
$$\text{(Innovation} = \frac{\text{Yes}}{\text{Yes} + \text{No} + \text{NA}})$$

of these three hypotheses and their accompanying theoretical base.

In sum, the analysis of these data cast further doubt on the appropriateness of the theory, and this constellation of variables and measurement procedures with regard to the organizational system.

The final hypothesis concerning peer social relations in the educational organization is number 22, which suggests that more innovation will occur in those schools where teachers can agree upon the diagram or map best describing their school. Their agreement is independent of which map they agree upon. The data relevant to this hypothesis are presented in table 31. Staff agreement was interpreted as occurring when 50% or more of the staff selected the same diagram, a state of affairs that occurred in six schools. The six high agreement schools have a mean self-reported innovation percentage of 68.7%; compared with 55.1% for low agreement schools. But this trend is not statistically significant, and is not supported by the peer-reported data.

Teacher-Principal Relations and Innovation

We have theorized that the character of perceived authority relations in a school is related to staff innovation. In this section we review hypotheses and findings to this effect. Some of these inquiries are on an individual level of analysis, and some organizational; we will specify each below.

Hypothesis 23 suggests that those teachers who see their principal as more supportive and encouraging of innovation will innovate more often. The data relevant to this individual level hypothesis are presented below. The data in tables 32A and 32B do not confirm the hypothesis; the relationship between the variables in this table are

TABLE 31

TEACHER AGREEMENT ON SOCIAL RELATIONS MAP RELATED TO
SELF-REPORT AND PEER-REPORT OF INNOVATION

Innovation Measure	Schools Where Staff Agrees (N = 6)	Schools Where Staff Disagrees (N = 10)
A. Self-Reported Innovation		
Mean Percent	68.7	55.1
Sum of Ranks	61	75
	U = 20; NS	
B. Peer-Reported Innovation		
Mean Percent	07.2	08.3
Sum of Ranks	53	83
	U = 28; NS	

TABLE 32A

PERCEIVED PRINCIPAL SUPPORT RELATED TO SELF-REPORT OF INNOVATION

Principal Support	Self-Reported Innovation		
	No	Yes	Total
	(N=81)	(N=106)	(N=187)
None	34%	66%	(N=44)
Low	46%	53%	(N=63)
Medium	36%	64%	(N=25)
High	51%	49%	(N=55)

$$\chi^2 = 3.55; \text{ NS}$$

TABLE 32B

PERCEIVED PRINCIPAL SUPPORT RELATED TO PEER-REPORT OF INNOVATION

Principal Support	Peer-Reported Innovation			
	0	1	2 or more	Total
	(N=92)	(N=65)	(N=74)	(N=231)
None	50%	19%	31%	(N=58)
Low	39%	36%	25%	(N=80)
Medium	38%	24%	38%	(N=29)
High	33%	28%	39%	(N=64)

$$\chi^2 = 8.70; \text{ NS}$$

not only not significant, they are confusing. This index of principal support was constructed by joining all seven discrete items on the principal scale together into one measure. In table 33 we have attempted to view the separate trends and relations between teachers self-report of innovation and each of the seven dimensions of principal behavior or performance.

It is clear from this table that certain items, certain dimensions of perceived principal activity, are much more highly related to teacher innovation than are others. For instance, "making constructive suggestions" is significantly related to teacher innovation ($p. < .05$). "Talking about professional growth," "showing he knows what's going on," and "openly supporting creative efforts" all indicate trends in support of our general hypothesis. Other items, however, do not appear to be associated at all with teacher innovation.

At the organizational level of analysis, the teacher responses in each school were averaged to produce staff perceptions of their principal. These mean scores do not appear to be related to school rates of innovation. We abstracted from this scale those two items that seemed most relevant: "Makes constructive suggestions" and "openly supports creative efforts." The data relevant to these two items are presented in tables 34 and 35. Table 34 demonstrates that there are no clear trends in the data that support the hypothesis. With regard to "constructive suggestions" (Table 35) there appears to be a slight trend in the reverse direction. It seems clear that building level means in principal perceptions are not clearly related to the degree of staff innovation in the school. At the same time, there is some indication that individual teacher perceptions of the principal may be

TABLE 33

DIMENSIONS OF PERCEIVED PRINCIPAL SUPPORT RELATED
TO SELF-REPORT OF INNOVATION

Principal Support Dimension		Self-Reported Innovation		
		No	Yes	Total
		(N=81)	(N=107)	(N=188)
A. Makes Constructive Suggestions	High	34%	66%	(N=89)
	Low	51%	48%	(N=99)
		(N=81)	(N=106)	(N=187)
B. Brings Literature	High	42%	58%	(N=72)
	Low	44%	56%	(N=115)
		(N=78)	(N=100)	(N=178)
C. Maximizes Skills	High	45%	55%	(N=80)
	Low	43%	57%	(N=98)
		(N=81)	(N=100)	(N=181)
D. Talks About Growth	High	38%	62%	(N=79)
	Low	50%	50%	(N=102)
		(N=81)	(N=106)	(N=187)
E. Knows What Is Going On	High	40%	60%	(N=127)
	Low	50%	50%	(N=60)
		(N=81)	(N=107)	(N=188)
F. Warm Personal Interest	High	44%	56%	(N=85)
	Low	43%	57%	(N=103)
		(N=78)	(N=105)	(N=183)
G. Supports Creative Efforts	High	38%	62%	(N=82)
	Low	47%	53%	(N=101)

$\chi^2_A = 5.99; p < .05$ $\chi^2_B = .15; NS$ $\chi^2_C = .09; NS$ $\chi^2_D = 2.65; NS$

$\chi^2_E = 1.60; NS$ $\chi^2_F = .02; NS$ $\chi^2_G = 2.10; NS$

TABLE 34

STAFF PERCEPTION OF PRINCIPAL AS "MAKING CONSTRUCTIVE SUGGESTIONS"
RELATED TO SELF-REPORT AND PEER-REPORT OF INNOVATION

Innovation Measure	Schools Where Principal Often Makes Suggestions (N = 9)	Schools Where Principal Seldom Makes Suggestions (N = 7)
A. Self-Reported Innovation		
Mean Percent	60.1	56.0
Sum of Ranks	60	66
	U = 31; NS	
B. Peer-Reported Innovation		
Mean Percent	06.4	08.3
Sum of Ranks	75	61
	U = 30; NS	

TABLE 35

STAFF PERCEPTION OF PRINCIPAL AS "OPENLY SUPPORTIVE OF CREATIVE EFFORTS" RELATED TO SELF-REPORT AND PEER-REPORT OF INNOVATION

Innovation Measure	Schools Where Principal Often Openly Supports (N = 9)	Schools Where Principal Seldom Openly Supports (N = 7)
A. Self-Reported Innovation		
Mean Percent	56.4	65.0
Sum of Ranks	70	66
	U = 25; NS	
B. Peer-Reported Innovation		
Mean Percent	5.9	10.4
Sum of Ranks	70	66
	U = 25; NS	

related to their own report of innovativeness. It may well be that computing building level means has obliterated important and relevant individual and small group differences within buildings.

Other teacher attitudes toward the principal focus on their perception and reaction to his influence in the local school system. Hypothesis 24 deals with staff perceptions of the principal's influence on curriculum relative to his supervisors, and hypothesis 25 deals with staff opinions regarding the influence they feel he should have relative to higher administration. We anticipated that in those schools where the principal is seen as having, or should have, more upwards influence, staffs would innovate more. These data are presented in tables 36 and 37. The data in these tables clearly do not confirm these hypotheses; neither the accumulated perception or desired condition of principal's upwards influence with his supervisors seems to be positively related to self-reported or peer-reported measures of school innovativeness.

Our experiences with hypotheses 23 and 25 leave us with little confidence in the originally predicted outcome of hypothesis 26. Hypothesis 26 suggests that schools where staffs see their principals as supportive of innovation and desire him to have more influence, should innovate more. Data relevant to this proposition are presented in table 38. Unfortunately, our suspicions are correct, as there is no significant relationship between the variable conditions proposed.

The remaining hypotheses regarding staff-principal relations focus upon certain principal reports of his own attitudes and or behavior, as well as those of his staff. For instance, hypothesis 27 suggests that principal-staff congruence about staff sociometric leaders should be related to school innovativeness. In order to

TABLE 36

STAFF PERCEPTIONS OF PRINCIPAL INFLUENCE RELATIVE TO HIS SUPERVISORS
RELATED TO SELF-REPORT AND PEER-REPORT OF INNOVATION

Innovation Measure	Schools Where Principals Have High Influence Upward (N = 7)	Schools Where Principals Have Low Influence Upward (N = 9)
A. Self-Reported Innovation		
Mean Percent	55.0	64.4
Sum of Ranks	51	85
	U = 23; NS	
B. Peer-Reported Innovation		
Mean Percent	07.0	08.5
Sum of Ranks	62	74
	U = 29; NS	

TABLE 37

STAFF DESIRES REGARDING PRINCIPAL INFLUENCE RELATIVE TO HIS SUPERVISORS
RELATED TO SELF-REPORT AND PEER-REPORT OF INNOVATION

Innovation Measure	Schools Where Staffs Desired More Principal Influence Upwards (N = 10)	Schools Where Staffs Desired Less Principal Influence Upwards (N = 6)
A. Self-Reported Innovation		
Mean Percent	57.3	65.0
Sum of Ranks	78	58
	U = 23; NS	
B. Peer-Reported Innovation		
Mean Percent	08.7	06.5
Sum of Ranks	98	38
	U = 17; NS	

TABLE 38

STAFF PERCEPTIONS THAT PRINCIPAL IS SUPPORTIVE AND STAFF DESIRES
MORE UPWARDS INFLUENCE FOR HIM RELATED TO SELF-REPORT
AND PEER-REPORT OF INNOVATION

Innovation Measure	Schools Where Principal is Supportive And Upwards Influence Is Desired (N = 5)	Schools Where Principal is Not Both Supportive and Upwards Influence Desired (N = 11)
A. Self-Reported Innovation		
Mean Percent	51.8	64.0
Sum of Ranks	32	104
	U = 17; NS	
B. Peer-Reported Innovation		
Mean Percent	07.5	08.0
Sum of Ranks	49	87
	U = 21; NS	

measure such congruency we first categorized teachers into: (1) those receiving less than the mean number of nominations in a school; (2) those receiving the mean number; (3) those receiving more than the mean number of nominations; and (4) those receiving more than one standard deviation above the mean nominations. If the principal selects, as a sociometric leader, a teacher in either of the first two categories he receives no credit. If the principal selects a teacher in category 3 he gets one point, and for every category 4 teacher he selects he receives two points. Since the principal makes three choices, he can receive as much as six points. Low congruence is defined as the principal receiving three or less points and high congruence as receiving four or more points. The data illustrating the relation between this measure of principal-staff congruence and school innovativeness are presented in tables 39 and 40. The data in these tables do not confirm our hypotheses. With regard to influence, in table 39 there is no relationship at all. In Table 40 there begins to be the appearance of a slight counter trend; but this trend is not statistically significant.

Principals' statements of their own role priorities were grouped into those that seemed to be most relevant to professional growth activities, those most relevant to the management of interpersonal relations, and those most relevant to traditional organizational administration. The number of professional growth statements seen as most important was added to the number of traditional administration items seen as least important. From this result was subtracted the number of traditional administrative items seen as most important and the number of professional growth choices seen as least important. The outcome, an index of the principal's priority of his professional

TABLE 39

PRINCIPAL CONGRUENCE WITH STAFF NOMINATIONS FOR INFLUENCE
RELATED TO SELF-REPORT AND PEER-REPORT OF INNOVATION

Innovation Measure	Schools With High Congruence (N = 8)	Schools With Low Congruence (N = 8)
A. Self-Reported Innovation*		
Mean Percent	46.3	48.9
Sum of Ranks	67	69
	U = 31; NS	
B. Peer-Reported Innovation		
Mean Percent	06.5	08.9
Sum of Ranks	59	77
	U = 26; NS	

* In this table the dependent variable is computed on the basis of all teachers in the school, regardless of whether or not they answered the innovation question.
$$\left(\text{Innovation} = \frac{\text{Yes}}{\text{Yes} + \text{No} + \text{NA}} \right)$$

TABLE 40

PRINCIPAL CONGRUENCE WITH STAFF NOMINATIONS FOR ENTHUSIASM
RELATED TO SELF-REPORT AND PEER-REPORT OF INNOVATION

Innovation Measure	Schools With High Congruence (N = 7)	Schools With Low Congruence (N = 9)
A. Self-Reported Innovation*		
Mean Percent	42.1	51.8
Sum of Ranks	51	85
U = 23; NS		
B. Peer-Reported Innovation		
Mean Percent	06.5	08.9
Sum of Ranks	59	77
U = 31; NS		

* In this table the dependent variable is computed on the basis of all teachers in the school, regardless of whether or not they answered the innovation question.
$$\left(\text{Innovation} = \frac{\text{Yes}}{\text{Yes} + \text{No} + \text{NA}} \right)$$

growth enhancement role compared to his traditional administrative role, is related to school innovation in Table 41. The data indicate there are no differences between the staff percentages of self-reported innovations in schools characterized by different principal role priorities. However, principals who stress a traditional administrative role have staffs with significantly greater peer-reported innovations. Although this finding contradicts our expectations, its interpretation is dependent upon greater specification of both principal behavior and the character of staff innovation.

A similar index was computed for the combination of professional growth and interpersonal relations priorities compared with traditional administrative concerns. This further comparison does not seem to be related to any differences in self or peer-reported staff innovativeness.

Finally, principals were asked whether they, themselves, were trying innovations. Since it was proposed, in hypothesis 30, that innovating principals would be related to innovative staffs, these conditions are examined in table 42. Here, those principals who reported they were not themselves innovating were compared with those reporting innovations focusing on students and their learning, and those reporting innovations focusing on teaching roles, facilities and conditions. This non-significant table does not confirm our hypothesis; there are no important differences in staff innovations in schools with different types of principal innovativeness, nor in schools where principals do or do not innovate.

These several findings regarding principals' own perceptions, priorities and activities represent another cluster of non-confirmations of our hypotheses. It would appear that principal attributes of the

TABLE 41

PRINCIPAL ROLE PRIORITIES RELATED TO SELF-REPORT
AND PEER-REPORT OF INNOVATION

Innovation Measure	Principal Priority: Staff Professional Growth (N = 7)	Principal Priority: Traditional Administration (N = 9)
A. Self-Report Innovation		
Mean Percent	60.7	59.8
Sum of Ranks	61	75
	U = 30; NS	
B. Peer-Report Innovation		
Mean Percent	04.8	10.2
Sum of Ranks	40	96
	U = 12; p = < .05	

TABLE 42

PRINCIPAL SELF-REPORT OF INNOVATION RELATED TO SELF-REPORT AND
PEER-REPORT OF INNOVATION

Innovation Measure	Schools Where Principals Report Teacher Focused Innovations (N = 5)	Schools Where Principals Report Student Focused Innovations (N = 6)	Schools Where Principals Report No Innovations (N = 5)
A. Self-Reported Innovation			
Mean Percent	64.2	65.0	61.2
	$U_{1.2} = 13; NS$	$U_{2.3} = 12; NS$	$U_{1.3} = 12; NS$
B. Peer-Reported Innovation			
Mean Percent	9.1	7.6	6.9
	$U_{1.2} = 12; NS$	$U_{2.3} = 12; NS$	$U_{1.3} = 12; NS$

sort examined are generally irrelevant to staff innovation. In this regard, as elsewhere throughout this chapter, we are struck by the consistent non-confirmation of hypotheses. It seems appropriate now to turn to a more careful and systematic consideration of these phenomena.

Conclusions

Both with regard to peer and principal relations it is clear that hypotheses concerning the organizational level of analysis were consistently non-confirmed. Of the three potential sources of error; the theory, the measurement, and the analysis, we believe a major failure lies in our conceptual and operational uses of various measures. It is simply inadequate to attempt to characterize an organizational unit by summing or averaging the attitude scale responses of all the members of the organization. The organization is more than that, it is also an ongoing set of rules of behavior traditions, norms and goals. More appropriate measures of some of these variables would have concentrated upon local school norms, upon the estimation of system characteristics and the like.

It is also probable that the large number of non-significant findings and non-trends are a function of the relative homogeneity of the schools in this sample. Despite our original hopes, these relatively traditional middle class and lower-middle class school systems place teachers in similar roles in fairly similar buildings. This tendency is accentuated by our limitation to elementary schools. It may well be that there are only very limited organizational dimensions upon which these schools differ. If this is the case, not only did we inadequately tap the organizational qualities of these units,

we surveyed a relatively prescribed and perhaps inappropriate range of dimensions of relatively alike organizations.

We have already alluded to several circumstances in which the independent variable responses were highly skewed, showing little response variation. In this connection may lie a potential explanation of the most perplexing question of all: why did certain variables related to teacher innovation fail to relate to organizational innovation? This question demands some direct attention, and it seems there are plausible responses.

In several cases it appears that there is greater response variation within schools than among schools. For instance, let us consider the variable of teacher influence on the curriculum. Table 43 presents the mean and variance scores within all sixteen schools on this variable. The difference between the smallest mean (2.08) and the largest mean (3.17) is only 1.09, a very small range. Moreover, the variance between schools means is only .12. Five of the schools have a within-school variance greater than the range, and all the schools have within-school variances greater than the between-schools variance. Table 44 presents the results of an analysis of variance performed on these data. The findings indicate that the between-school variance is not significantly larger than the within-school variance. An interclass correlation (Hayes, 1963, p 424) performed on these data produces a P_1 of .03, indicating the percent of variance accounted for by the differences among schools. None of the peer-related attitudinal or structural variables indicate a significant F score on analyses of variance.

Similar analyses of variance do show significant F scores on some items concerned with staff perceptions of the principal's support

TABLE 43

SCHOOL MEAN AND VARIANCE SCORES FOR VARIABLE OF TEACHER
INFLUENCE ON THE CURRICULUM

School	Mean	Variance
01	2.86	1.409
02	2.64	.231
03	2.54	1.788
04	2.08	.686
05	2.21	.822
06	2.33	.889
07	3.17	1.471
08	2.38	.734
09	3.00	1.250
10	3.00	1.077
11	2.10	.691
12	2.67	.472
13	3.00	.719
14	2.88	.610
15	2.50	.951
16	2.83	.555

TABLE 44

ANALYSIS OF VARIANCE OF SCHOOL DATA ON TEACHERS'
INFLUENCE ON THE CURRICULUM

Source of Variance	D.F.	Sum of Squares	Mean Square
Between Groups	15	20.67	1.38
Within Groups	205	191.80	.94
Total	220	212.47	

F = 1.47; NS

of innovation. Intra-class correlations indicate that the items "the principal makes constructive suggestions" ($P_1 = .20$) and "the principal openly supports creative efforts" ($P_1 = .28$), do have sizable portions of their variance accounted for by inter-school variance. In general, however, it is apparent that the independent variables vary more within schools than between schools.

In order for our analysis to be meaningful, we would have required that a pattern emerge within each school, and some different patterns emerge in different schools. In other words, we had hoped for a relatively small variance within schools and a relatively large variance between schools. Obviously we could not expect that the school mean vary along the entire response range, but we did hope for more differences than occurred.

With regard to discernible patterns within schools, in only five schools did 75% or more of the teachers agree in their responses to any single variable, and in only nine schools did 60% or more agree. What might be meaningful, of course, would be a comparison of schools where there is a pattern with those where there is not. This is essentially the procedure utilized in reviewing hypothesis 22. In no case do analyses of this sort produce significant findings with regard to degree of staff agreement on a variable and innovation. One illustrative relationship, again with teacher influence as the target, is shown in table 45.

There seem to be three general explanations for the generally non-significant findings reported in this chapter, and they are not mutually exclusive: (1) inappropriate variables and/or measures were selected to survey the organizational variables; (2) organizational variables of the type and complexity we reviewed do not have a major

TABLE 45

STAFF AGREEMENT ON DEGREE OF INFLUENCE RELATED TO SELF-REPORTED
AND PEER-REPORTED INNOVATION

Innovation Measure	Schools With High Agreement About Influence (N = 7)	Schools With Low Agreement About Influence (N = 7)
A. Self-Reported Innovation		
Mean Percent	61.4	59.2
Sum of Ranks	75	61
	U = 30; NS	
B. Peer-Reported Innovation		
Mean Percent	08.0	07.7
Sum of Ranks	77	59
	U = 31; NS	

association with degrees of staff innovation; (3) the schools in our sample are much more alike than different on these variables, and the teachers in these schools are more different than alike.

Are all schools likely to be this way? Are all organizational variables likely to be unrelated to staff innovation? What other variables or variable measures might be used? These very appropriate questions will be undertaken in the final chapter, as we summarize and conclude this study.

CHAPTER VI

SUMMARY

In this chapter we review the major theoretical principles, methods and findings of the study. In addition, we review some of the problems involved in the conduct of this research. Our aim is to present a series of recommendations to facilitate and guide further study. An additional original intent was to conclude with a series of managerial suggestions for teachers and principles^{all}, but in view of the preponderance of non-significant results, that no longer seems to be an appropriate task.

The problem under consideration in this study is the discovery of the social and professional conditions surrounding innovative classroom teaching. It is clear that some teacher flexibility and innovation is essential to meeting the demands of ever-changing materials and students. Therefore, it seems appropriate to inquire into the school conditions that promote the use of teacher's expertise in facilitating such innovation. A number of research reports and reviews demonstrate how often such variables are overlooked in research on teaching and learning. The study is limited to an inquiry into one cluster of these conditions, the internal staff relations in a sample of sixteen elementary schools.

A review of studies from several research traditions led to a research focus on the nature of innovation and certain critical elements in the internal social system of the school. In this

study an innovation is defined as a new or unusual teaching practice a teacher reports he is using, or that a peer reports a colleague is using. Among the elements of the staff social system studied are characteristics and attitudes of individual teachers including: (1) background and demographic variables; (2) teachers' perceptions of, and attitudes toward, their peers; (3) teachers' perceptions of, and reactions to, the principal's behavior. Moreover, certain school organizational characteristics are examined, such as: (4) common staff attitudes and; (5) the structure of staff social relations. Finally, ^{aspects} pupils of the managerial system were studied: (6) the principal's priorities and; (7) the principal's sensitivity to issues of staff social relations and innovation. Hypotheses regarding these variables grew out of reviews of research in industrial firms, scientific organizations and bureaucracies, as well as schools; and innovation studies in educational, agricultural and pharmaceutical systems.

These other studies seem to suggest that teachers operating in a supportive, yet non-coercive peer atmosphere are likely to be more innovative than non-supported colleagues. Some professional autonomy, as well as integration into a network of peer relations, and feelings of influence in staff decision-making also was thought to be important for innovation. With regard to influence, it was thought that an organizational atmosphere that promoted multiple influence patterns would be most conducive to staff innovation. Finally, a principal orientation towards promoting staff innovation and the constant encouragement of professional growth activities was considered relevant.

The findings of this study only minimally support these expectations. Chapter IV suggests that educational level, teaching experience,

and felt and desired influence appear to be positively and significantly related to one or more of the dependent variable measures. Some aspects of teacher-peer relations also appear to be positively and significantly related to one or more of the measures of innovation; perception of the staff as a cohesive unit, and being nominated by peers as a high communicant, as highly influential, and as highly enthusiastic about new approaches to teaching.

The findings in Chapter V do not confirm our expectations at the organizational level of analysis. In general, it appears that inadequate measurement procedures, too limited a choice of variables, and too narrow a range of school differences account for the non-confirmations. With regard to several independent variables, it was demonstrated that there were greater variances among teachers within schools than among schools.

The problems as well as the findings of this study suggest several fruitful avenues of further research and study:

1. Greater specification of the dependent variable. A number of findings can be interpreted in several ways, dependent upon the character of the innovation. The source of the innovation; whether it was invented, adapted from an other teacher, or gotten from somewhere in the school hierarchy, needs to be determined. Moreover, the differences between private classroom innovation and publicly visible practices need to be clarified. Finally, the different kinds of educational values and classroom variables and processes inherent in each innovation must be categorized and considered.

2. Information on teachers values about their classrooms and the process of education. Whether teachers are concerned about mental health in the classroom would seem to have major influence on their innovation in this area. Regardless of how innovations are categorized, since their use is a value-related choice, teachers' values must be assessed to understand their relevance on innovation.

3. Information about teachers' personality. Many aspects of the teacher's personal style seem important in assessing his flexibility and openness to new teaching ideas. Variables such as dogmatism flexibility, and social motivation would be important.

4. A greater range of teacher attitudes toward the school and education. Dimensions such as commitment to the school and the profession, alienation, loyalty to the school, and conflict between family and school need to be explored. Several of these factors influence the amount of physical or psychic energy a teacher could give to an innovative role if he so wished.

5. Information on teachers' other duties in school. Since one of the aspects of peer-reported innovation appears to be public visibility in the staff social system, more adequate measures of this variable need to be made. In this context, too, we should see evidence of different values and energy priorities.

6. Some index of teachers' competency. Although sociometric measures have been elicited on several personal and professional dimensions, a peer or principal rating of teacher competency would seem to be helpful in validating the notion of innovation as an indicant of a fully developed professional role.

7. Assessment of school norms. Several attempts were made to this study to infer aspects of school norms. More adequate means need to be devised to assess such norms in the school. What teachers see as the rules of the game and the accustomed ways of behaving in school might constitute one means for examining this variable.

8. School indices of organizational climate. A number of scales have been devised by other researchers to study satisfaction directly. In addition, teacher evaluation of the staff and turnover rates may represent two appropriate ways to discover how teachers feel about their school as an organization.

9. Research sites which differ more. One of the major problems in the organizational analysis attempted in Chapter V was the lack of variance between schools in the sample. A cross-class, cross-regional or cross-cultural sample of schools should help us determine whether this homogeneity is an artifact of this sample or generally true of school life. If the former, the dimensions along which schools may differ are critical to discover and examine.

A resurvey with these variables and measures in mind might accomplish a great deal by way of advancing our understanding of the social organization of teaching and learning. These advances could pave the way for more successful designs and strategies for school improvement and educational change.

BIBLIOGRAPHY

- Barakat, H. Alienation from the school system: Its structure and dynamics. Unpublished doctoral dissertation, University of Michigan, 1966.
- Becker, H. The teacher in the authority system of the public school. *Journal of educational sociology*, 1953, 27, 128-141.
- Benne, K. and Sheats, P. Functional roles of group members, *Journal of social issues*, 1948, 4, 42-45.
- Cartwright, D. and Zander, A. (Ed). *Group Dynamics*, New York: Harper and Row, 1960.
- Charters, W. The Social Background of Teaching. In N. Gage (Ed.), *Handbook of research on teaching*. Chicago: Rand McNally, 1963.
- Chesler, M., Schmuck, R. and Lippitt, R. The principal's role in facilitating innovations. *Theory into Practice*, 1963, 2, 269-278.
- Chase, S. The teacher and policy making. *Administrators Notebook*, 1952, 1, 1-4.
- Chowdhry, K and Newcomb, T. The relative abilities of leaders and non-leaders to estimate opinions of their own groups. *Journal of abnormal and social psychology*, 1952, 47, 51-57.
- Coch, L. and French, J. Overcoming resistance to change. *Human Relations*, 1948, 1, 512-532.
- Festinger, L. Informal social communication. *Psychological Review*, 1950, 57, 271-282.
- Foshay, A. Forward. In M. Miles (Ed.), *Innovation in Education*. New York: Columbia University, 1964.
- Fox, R. and Lippitt, R. The innovation of classroom mental health processes. In M. Miles (Ed.), *Innovation in Education*. New York: Columbia University, 1964.
- Fox, R., Lippitt, R. and Schmuck R. *Pupil-Teacher Adjustment and Mutual Adaptation in Creating Classroom Learning Environments*. Ann Arbor, Michigan: Institute for Social Research, 1964.
- French, J., Israel, J., Asa, D. An experiment on participation in a Norwegian factory. *Human Relations*, 1960, 13, 3-19.
- Getzels, J. and Guba, E. Social behavior and the administrative process. *School Review*, 1957, 65, 423-441.

- Gouldner, A. *Patterns of industrial bureaucracy*, Glencoe, Ill.: Free Press, 1954.
- Gross, N. and Herriot, R. *Staff leadership in public schools*, New York: Wiley, 1965.
- Guba, E. The change continuum and its relation to the Illinois plan for program development for gifted children. Unpublished paper, Conference on educational change, Urbana, Illinois, 1966.
- Guba, E. and Bidwell, C. *Administrative relationships*, Chicago: Midwest Administration Center, University of Chicago, 1957.
- Halpin, A. *The leadership behavior of school superintendents*, Columbus, Ohio: Ohio State University Press, 1956.
- Hayes, W. *Statistics for psychologists*, New York: Holt, Rinehart and Winston, 1963.
- Homans, G. Group factors in worker productivity. In E. Maccoby, T. Newcomb and E. Hartley (Eds.), *Readings in Social Psychology*, New York: Holt, Rinehart and Winston, 1958.
- Kahn, R. The prediction of productivity. *Journal of Social Issues*, 1956, 12, 41-49.
- Kahn, R. and Katz, D. Leadership practices in relation to productivity and morale. In D. Cartwright and A. Zander, (Ed.), *Group Dynamics*, New York: Harper and Row, 1960.
- Katz, D. and Kahn, R. *The social psychology of organizations*. New York: Wiley, 1966.
- Katz, E. The social itinerary of technical change: two studies on the diffusion of innovation. *Human Organization*, 1961, 20, 70-82.
- Leavitt, H. Some effects of certain communication patterns on group performance. *Journal of abnormal and social psychology*, 1951, 46, 38-50.
- Likert, R. *New patterns of management*, New York: McGraw Hill, 1961.
- Likert, R. Effective supervision: an adaptive and relative process. *Personnel psychology*, 1958, 11, 317-352.
- Lippitt, R., Polansky, N., Redl, F. and Rosen, S. The dynamics of power. *Human Relations*, 1952, 5, 37-64.
- March, J. and Simon, H. *Organizations*, New York: Wiley, 1958.

- Menzel, H. and Katz, E. Social relations and innovation in the medical profession. *Public Opinion Quarterly*, 1955, 19, 337-352.
- Merton, R. *Social theory and social structure*, Glencoe, Ill.: Free Press, 1957.
- Miles, M. Planned change and organizational health: figure and ground. In *Change processes in the public schools*. Eugene, Oregon: University of Oregon Press, 1965.
- Miles, M. (Ed.). *Innovation in education*, New York: Columbia University, 1964.
- Pellegrin, R. An analysis of sources and processes of innovation in education. Unpublished paper, Conference on the role of demonstration centers in educational change. Urbana, Illinois, 1966.
- Pelz, D. Motivation of the engineering and research specialist. *General Management Series*, 1957, 186, 25-46.
- Rogers, E. What are innovators like? In *Change processes in the public schools*. Eugene, Oregon: University of Oregon Press, 1965.
- Rogers, E. *Diffusion of innovations*. New York: Free Press, 1962.
- Schachter, S., Ellertson, N., McBride, D., and Gregory, D. An experimental study of cohesiveness and productivity. *Human Relations*, 1951, 4, 229-238.
- Schmuck, R., Chesler, M., and Lippitt, R. *Problem-Solving to improve classroom learning*. Chicago: Science Research Associates, 1966.
- Schmuck, R. Socio-emotional characteristics of classroom peer groups, Unpublished doctoral dissertation, University of Michigan, 1962.
- Seashore, S. *Group cohesiveness in the industrial work group*. Ann Arbor, Michigan: Institute for Social Research. 1954.
- Tannenbaum, A. The relationship between personality and group structure. Unpublished doctoral dissertation, Syracuse University, 1954.
- Van Egmond, E. Social interrelationship skills and effective utilization of intelligence in the classroom, unpublished doctoral dissertation, University of Michigan, 1960.

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